HYDROIDS OF THE 1934 ALLAN HANCOCK PACIFIC EXPEDITION

(With Fifteen Plates)

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Introduction

An invitation to accompany the 1934 Hancock Expedition on VELERO III, to collect coelenterates, and more especially hydroids, in such an extensive virgin area, was gladly accepted.

In the ten weeks' cruise opportunity was afforded to collect in the Revilla Gigedo Islands, the Galapagos Islands (where three weeks were spent), and the mainland coast from Guayaquil, Ecuador, to San Diego, California. The Gulf of California was not visited. Stops were made in 40 locations and collections were made at 161 stations, 104 of which were dredging stations.

In most of the area covered the sea bottom was suitable for coelenterate growth, although at times it was rough enough to make dredging somewhat difficult. The coast of northern Ecuador and of Colombia, adjacent to the tropical rain forests, provided the main exception. For an undetermined distance off shore here the bottom is covered with such a fine silt or ooze that, in places, it would not trip the bottom sampler. In this area hydroids could be obtained only by dredging in shallow water over the surface of the reefs running out from shore. With the exception of this muddy area, less material in general was obtained from the same amount of effort in the oceanic area than from the mainland coast. This does not necessarily mean that the oceanic fauna is less rich. There have been so few soundings recorded in the oceanic area and there is so little information as to the nature of the bottom that dredging is much of a speculative procedure. The Mexico coast was particularly rich in hydroids. The best catch of the whole expedition was obtained just east of the islands off Navidad Head, at the entrance to Tenacatita Bay, where 44 species were obtained at the one station.

As the detailed geography of this region is not, in general, well known, it may be wise to give here a list of the locations where collections were made, to avoid the necessity of giving the details in connection with the distribution of the species.

Locations

Revilla Gigedo Islands, 18° to 21° N., 106° to 115° W.
- Socorro Island
  - In Braithwaite Bay, south shore
- Clarion Island, off south shore

Clipperton Island, 10°17′ N., 109°13′ W.

Galapagos Islands, between 2° N. and 2° S. and between 89° and 92° W.
- Wenman Island, off the northeast coast
- Narborough Island
  - Lagoons near east coast
- Strait between Narborough and Albemarle islands
- Albemarle Island
  - Albemarle Point to the northeast
  - On west coast
    - Banks Bay
    - Reef about three miles north of Tagus Cove
    - Tagus Cove
    - Christopher Point
  - On east coast
    - Cartago Bay
- James Island
  - James Bay on west coast
  - Sulivan Bay to the northeast, between James and Bartholomew islands
- North Seymour Island, west coast
- South Seymour Island, west coast
- Indefatigable Island
  - Academy Bay, south coast
- Strait between Indefatigable and Charles islands
- Charles Island
  - Black Beach, west coast
  - Postoffice Bay, northwest coast
- Chatham Island
  - Stephens Bay, north coast
- Hood Island
  - Gardner Bay, northeast coast, between Hood and Gardner islands

Ecuador
- Santa Elena Bay, 80 miles north of the mouth of the Guayas River
- La Plata Island, 14 miles off the coast
- San Francisco Bay, near the northern boundary

Colombia
- Gorgona Island, 24 miles off coast
- Cabita Bay
- Port Utria

Panama
- Jicaron Island
- Jicarita Island
- Between Medidor and Pacora islands
- Pacora Island
- Bahia Honda
- Secas Islands

Costa Rica
- Port Culebra
- South Viradores Islands

Mexico
- Tangola-Tangola and Santa Cruz bays
- Petatlan Bay
  - White Friars Islands, at entrance
  - Off Morro de Petatlan
- Tenacatita Bay
  - Off Tenacatita Point
  - East of islands off Navidad Head
  - Off Navidad Head
- Isabel Island, 17¾ miles from mainland coast
- West coast of Lower California
  - Santa Maria Bay
  - Thurloe Point
  - South Bay, Cerros Island

As the facilities for dredging were particularly good, as the conditions under which the work was done were nearly always favorable, and as all material was sorted the day it was collected, most of the specimens were preserved in very good condition and many were saved that, under less favorable conditions, might have disintegrated past

recognition. This applies particularly to gymnoblastic species, some of which deteriorate so readily. The excellence and the extent of the collection are worthy of comment.

In the text, the distribution within the area is given for all species. All new species, as well as all of those in which the gonosome has been observed for the first time, are described and figured. In referring to species already described, notation is made of the original description and in many cases, another reference to a paper in which the description, the figure, or the synonymy is given more fully. No attempt has been made to give a complete synonymy.

I am indebted to my wife and to Miss Ursula Dale, an Honors student in Zoology in the University of British Columbia, for the drawing of the figures used. These figures show the same magnification throughout—20 diameters.

To Captain G. Allan Hancock, who financed the expedition and provided the facilities and who, with the Chief Officer, W. Charles Swett, was tireless in doing everything possible in the way of arrangement to make the expedition a success, to the other biologists on board, W. L. Schmitt, H. W. Manter, W. R. Taylor, J. Garth, and F. Ziesenhenne, who were always on the lookout for useful material, and to all the other officers and men in the ship's company, who lost no opportunity to give assistance, I am under great obligation, which I am happy to be able to recognize at this time.

Distribution

Of the 173 species listed, 73 are described as new, and in 5 other species the gonosome has been observed for the first time. One new genus is introduced.

Of the 100 species previously described, 77, 77%, have been reported from the North Atlantic; 52, 52%, from the eastern Pacific coast of Canada and the United States; and 13, 13%, from the southern portion of the eastern Pacific and from the waters adjacent to the southern tip of South America. Thirty-seven species have been reported from both the Atlantic and the North Pacific, 40 species from the Atlantic but not from the North Pacific, but only 15 from the North Pacific and not from the Atlantic. Of the 15, 7 were obtained from the oceanic area, two of which were from this area only; 12 were obtained from the coast of Mexico, 8 of these from the west coast of Lower

California only; and only one from the mainland coast south of southeast Mexico.

Of the 13 species that have been reported from South America farther south than the area under consideration, 10 are cosmopolitan, one, *Plumularia magellanica,* was obtained from Black Beach, Charles Island, the station nearest to the Humbolt current, and another, *Obelia obtusidens,* from Santa Elena Bay, the most southerly location at which collections were made. The remaining species, *Silicularia pedunculata,* has been previously reported only from South Georgia. Why it should appear near Secas Islands, Panama, is difficult to understand.

For the purpose of further studying the intrinsic distribution, the area covered may be somewhat arbitrarily divided into three portions: Division A, to include all the stations near the oceanic islands; Division B, to include the mainland coast south of Balboa; Division C, to include the mainland coast north and west of Balboa.

Seventy-eight species were obtained in Division A, 60 in Division B, and 115 in Division C. Eighteen species were found in each of the three divisions; 2, in A and B only; 22, in A and C only; 21, in B and C only; 35, in A only; 20, in B only; and 55, in C only.

The distribution of species in the whole area, with the possible exception of the northern portion of the coast of Lower California, indicates strong affinities between the hydroid fauna here and that in the North Atlantic, more particularly in the West Indian area. There is evidence of some continuity of distribution in the California-Lower California area but practically no indication of such continuity at the southern extremity.

The species found in this area and in the West Indian region must be old species, existing as such since the earlier geological period when, in the Panama region, there was no interruption in the distribution from the Atlantic to the Pacific and vice versa. This long period of separation has given the opportunity for the evolution of the great number of new species, indicated by the number described in this paper.

In the area itself, the indication is that there is little interference to distribution along the whole length of the mainland coast, or between the oceanic division and the northwestern division of the mainland coast, but close association is lacking between the hydroids of the oceanic area and those of the coast of Ecuador and Colombia.

In passing northward along the west coast of Lower California, the most decided break in continuity of distribution in both fauna and

flora appears to be in the vicinity of Thurloe Point. There the large kelps, so characteristic of the coasts of the United States and Canada, make their first striking appearance, and other species appear, coincident with these.

In the collection, the various families are specifically represented as follows:

SPECIES DISTRIBUTION BY FAMILIES

Family	*Number of species obtained*	*Number of new species*
Clavidae	5	4
Tubidendridae	1	1
Corynidae	8	3
Atractylidae	8	4
Eudendridae	9	3
Hydractinidae	9	8
Pennaridae	1	—
Cladocorynidae	1	—
Tubularidae	4	3
Bonneviellidae	1	1
Campanularidae	39	14
Campanulinidae	4	2
Halecidae	18	7
Hebellidae	3	1
Lafoeidae	4	2
Synthecidae	4	3
Sertularidae	22	6
Plumularidae	32	11
TOTAL	173	73

As compared with the hydroid fauna of the Pacific coast of Canada and the United States, the percentage of gymnoblastic species is high, both in the complete list and in the list of new species (46 species, 26 new). Among the calyptoblastic families, the percentage of the Sertularidae is low, except in the genus *Sertularia,* and that of the Plumularidae is high. There are no representatives of the genera, *Selaginopsis* and *Abietinaria* and only two species of *Thuiaria,* all of which are common in the more northern waters. Except in the Gymnoblastea and in one or two of the smaller families of Calyptoblastea, in which the number of new species is high, there is much the same percentage of new species throughout.

To indicate the distribution of the species in detail a table is given herewith to show the species in each area or division as well as the more general distribution to which reference has been made above.

DISTRIBUTION TABLE

Species	*Div. A*	*Div. B*	*Div. C*	*South of Div. B*	*North of Div. C*	*North Atlantic*
Clava parva			x			
Corydendrium flabellatum			x			
Tubiclava laxa			x			
Tubiclava triserialis	x					
Turritopsis nutricula	x		x		x	x
Balea irregularis	x					
Coryne pusilla			x			x
repens	x					
Corynitis agassizii	x		x			x
Eugemmaria dendritica			x			
Gemmaria costata	x					x
gemmosa	x	x				x
Syncoryne flexibilis		x	x			
mirabilis	x			x	x	x
Bimeria gracilis	x		x		x	
laxa	x					
pygmaea		x				
tenella	x				x	
vestita		x	x	x		x
Bougainvillia crassa		x	x			
Perigonimus repens	x	x	x	x	x	x
robustus			x			
Eudendrium breve	x					
capillare			x		x	x
carneum	x	x	x			x
certicaule	x					
exiguum		x				x
nodosum		x				
ramosum	x		x		x	x
tenellum	x	x	x		x	x
tenue	x		x			x
Hydractinia carolinae			x			x
disjuncta			x			
epispongia			x			
hancocki	x					
longispina	x					
multispina	x					
polycarpa		x				
quadrigemina			x			

Species	*Div. A*	*Div. B*	*Div. C*	*South of Div. B*	*North of Div. C*	*North Atlantic*
Podocoryne reticulata		x				
Pennaria tiarella	x	x	x		x	x
Cladocoryne pelagica	x	x				x
Tubularia sp.		x				
crocea	x		x	x	x	x
integra	x		x			
multitentaculata			x			
Bonneviella minor	x					
Campanularia emarginata		x				
flexuosa			x			
gracilicaulis	x					
hincksi			x		x	x
urceolata			x		x	
volubilis	x		x		x	x
Clytia acutidentata	x		x			
attenuata	x				x	
carinadentata	x					
coronata			x			x
cylindrica	x		x		x	x
edwardsi	x		x		x	x
fascicularis		x	x			
inconspicua			x	x	x	x
irregularis			x			
johnstoni		x	x		x	x
kincaidi	x		x		x	x
longicyatha		x	x		x	x
longitheca			x		x	
multidentata		x				
raridentata	x		x		x	x
seriata			x			
Eucopella everta			x		x	
minor		x				
Gonothyraea clarki	x				x	x
gracilis	x	x	x	x	x	x
serialis		x				
Obelia alternata	x					
articulata	x					x
commissuralis			x		x	x
dichotoma	x	x	x		x	x
equilateralis		x				
geniculata	x			x	x	x
hyalina			x			x
microtheca		x				
obtusidens		x		x		
plicata	x	x	x		x	x
tenuis		x	x			

Species	*Div. A*	*Div. B*	*Div. C*	*South of Div. B*	*North of Div. C*	*North Atlantic*
Silicularia pedunculata			x	x		
Campanulina ramosa	x					
Cuspidella humilis		x	x		x	x
Lovenella nodosa		x	x			
producta		x			x	x
Endothecium reduplicatum			x			
Halecium articulosum			x		x	x
beani	x	x	x		x	x
bermudense	x					x
corrugatum		x			x	
fasciculatum	x					
flabellatum			x			
gracile			x			x
halecinum		x	x		x	x
insolens			x			
nanum			x			x
regulare			x			
tenellum	x		x	x	x	x
tortum			x			
vagans		x	x			
washingtoni	x		x		x	
Ophiodissa laxa			x			
negligens		x				
Hebella calcarata			x			x
Scandia corrugata			x			
mutabilis	x	x	x			x
Filellum serpens	x	x	x		x	x
Lafoea intermedia	x		x			
Lictorella adhaerens	x					
cervicornis	x				x	
Synthecium gracile		x	x			x
projectum			x			
rigidum		x	x			
symmetricum		x	x			
Diphasia paarmani	x					x
Pasya quadridentata	x	x	x			x
Sertularella ampullacea		x	x			
conica	x		x	x	x	x
exilis			x			
formosa		x	x			x
fusiformis	x				x	x
incisa			x			
rugosa	x		x		x	x
tenella	x	x	x		x	x
turgida			x		x	

Species	*Div. A*	*Div. B*	*Div. C*	*South of Div. B*	*North of Div. C*	*North Atlantic*
Sertularia anceps		x	x			
cornicina			x			x
desmoides	x		x		x	
dispar		x	x			
exigua			x			x
furcata			x		x	
mayeri		x	x			x
stookeyi	x	x	x			x
versluysi	x					x
Thuiaria simplex		x	x			
tubuliformis	x	x	x			x
Aglaophenia diegensis	x		x		x	
inconspicua	x		x		x	
praecisa			x			
rigida			x			x
Antennella avalonia			x		x	
compacta			x			
gracilis	x		x			x
Antennularia alternata	x					
irregularis		x				
tetraseriata	x					
Cladocarpus tortus		x				
Diplocheilus allmani			x		x	
Lytocarpus philippinus		x	x			x
Monostaechas quadridens	x	x	x			x
Plumularia acutifrons			x			
alicia			x		x	
alternata	x	x	x			x
biarmata			x			
corrugata			x		x	x
defecta			x			
delicata	x					
filicula		x				x
floridana	x	x	x			x
inermis	x					x
lagenifera	x		x		x	x
magellanica	x			x		
margaretta		x				x
propinqua			x			
setacea	x				x	x
sinuosa	x					
Schizotricha tenella			x			x
Streptocaulis pulcherrimus	x					x

Systematic Discussion

There is no necessity of saying much in the way of general discussion under this heading. Some changes have been made in nomenclature since early papers were published but nearly all of these have been introduced in more recent papers hence further reference is not necessary as far as they are concerned. There is one additional change. On account of priority difficulties, the genus *Pasythea* becomes *Pasya,* the name introduced by Stechow.

One new genus, *Eugemmaria,* is introduced that bears enough resemblance to *Gemmaria* to justify the name.

Suborder GYMNOBLASTEA

Family Clavidae

Genus CLAVA

Clava parva, new species

Plate 1, Fig. 1

Trophosome.—Solitary, scattered zooids arising from a thin encrustation on a gastropod shell; no stolon showing superficially; zooids small, 2 mm. high; tentacles about 20 in number, scattered, but leaving a considerable portion around the mouth free.

Gonosome.—Sporosacs in a single compact cluster, surrounding the hydrocaulis immediately below the proximal tentacles.

Distribution.—Jicarita Island, 30 fathoms. This is an unusual depth in which to find *Clava,* which is commonly littoral.

Genus CORYDENDRIUM

?Corydendrium flabellatum, new species

Plate 1, Fig. 2

Trophosome.—Colony coarse, flabellate, fascicled, 6 cm.; the irregularly placed branches are much more slender than the main stem. The coenosarc fills but a small portion of the perisarcal tubes, that go to form the fascicle. The free portion of the tube that passes out to the base of the hydranth is long and gradually curved outward from the stem or branch. This tube is very coarse, 0.4 mm. in diameter. The hydranth is stout with 20-24 tentacles.

Gonosome.—Not observed.

Distribution.—Off Secas Islands, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; off Isabel Island, 10-25 fathoms.

Genus TUBICLAVA

Tubiclava laxa, new species

Plate 1, Fig. 3

Trophosome.—A colony consists of numerous individual zooids growing out singly from a crust on the surface of gastropod shells; no stoloniferous network shows at the surface. The zooids are protected by a heavy, loose-fitting tube, reaching to the base of the hydranth; this tube may have numerous sand grains embedded in it. In the nutritive zooids, this tube has a maximum length of 35 mm.; it is nearly tubular or, in some cases, slightly tapering from tip to base. The hydranth is clavate, with 12-14 scattered tentacles.

Gonosome.—The tube of the generative zooid is short, less than 1 mm., but of much the same diameter as that of the nutritive zooid. The sporosacs are closely crowded on the blastostyle; there may be as many as 20 of them.

Distribution.—Tangola-Tangola, near shore, 15-20 fathoms.

?Tubiclava triserialis, new species

Plate 1, Fig. 4

Trophosome.—Zooids arising singly from a loosely reticular stolon to a height of about 3 mm.; the uncovered hydranth is three eighths of the total length. It is short and stoutly clavate with 20-24 tentacles arranged rather definitely in three closely placed series. The perisarcal tube, which is smooth, is thin but distinct.

Gonosome.—Not observed.

Distribution.—On coral, exposed at low tide, along the shore of Braithwaite Bay.

Genus TURRITOPSIS

Turritopsis nutricula McCrady

Oceania nutricula McCrady, Proc. Elliott Soc., 1859, pp. 55-90.
Turritopsis nutricula McCrady, *ibid.*, p. 127.
Fraser, Hydroids of Beaufort, 1912, p. 345.

Distribution.—On sponges associated with solitary corals, exposed at low tide, on the north shore of Tagus Cove; Gorgona Island, on coral, at low tide; South Viradores Island, 8-10 fathoms.

Family Tubidendridae

Genus BALEA

Balea irregularis, new species

Plate 1, Fig. 5

Trophosome.—Colony fascicled, 6 cm. in length, with few irregularly placed branches, much more slender than the main stem. Some of the tubes have naked coenosarc for at least a portion of their length. The hydranths appear on the branches only, growing from short hydrophores that are sessile on two of the tubes, one on each side of the branch; these are very irregularly arranged, sometimes quite isolated, sometimes with two in succession forming a definite pair, sometimes, on the distal portion of the branches, more segregated. The hydranth and its pedicel, both stout, are without visible perisarc, about 2 mm. long.

There are two sets of filiform tentacles, the proximal, having the appearance of being reduced in size and number (4), well separated from the distal set of 10-12 well-developed tentacles.

The sarcostyles are numerous on the main stem and the branches.

Gonosome.—Not observed.

Distribution.—Dredged in the open passage between Indefatigable and Charles islands, 65-70 fathoms.

This species bears much resemblance to *Balea mirabilis* Nutting; the most noticeable difference is in the nature of the proximal tentacles.

Family Corynidae

Genus CORYNE

Coryne pusilla Gaertner

Coryne pusilla GAERTNER, Pall. Spicil. Zool., I, Fasc. 10, 1774, p. 40.
HINCKS, British Hydroid Zoophytes, 1868, p. 39.

Distribution.—South Bay, Cerros Island, 10-15 fathoms.

Coryne repens, new species

Plate 1, Fig. 6

Trophosome.—Colony consisting mainly of individual hydroids arising from a creeping stolon that does not form any definite network over its support; the stolon is somewhat wavy but seldom distinctly

annulated. The hydranths appear on pedicels that may be as short as the hydranths themselves; the pedicels are distinctly annulated through quite a portion of their length. Occasionally branching takes place, in which case the main stem becomes more elongated. The hydranths are large, up to 2 mm. in length, with numerous rather slender capitate tentacles, quite evenly scattered over the whole surface.

Gonosome.—The sporosacs appear between the tentacles near the base of the hydranth.

Distribution.—Creeping over coralline at low tide, on Black Beach.

This species bears some resemblance to *Coryne crassa* Fraser, but is not so much inclined to branch. The hydranth is not so stout and the tentacles are more numerous and much more slender.

Genus CORYNITIS

Corynitis agassizii McCrady

Corynitis agassizii McCrady, Gymno. Charleston Har., 1859, p. 30.

Distribution.—On sponge at low tide, Wenman Island; Jicaron Island, 30 fathoms.

Genus EUGEMMARIA, new genus

Trophosome.—Zooids, like those of *Gemmaria,* grow from a strongly dendritic, reticular, or vesicular, chitinous support, which evidently is part of the colony.

Gonosome.—Gonophores produce sporosacs.

Eugemmaria dendritica, new species

Plate 2, Fig. 7

Trophosome.—Colony reaching a height of 7 cm., strongly branched, commonly dichotomously, the branched colony being almost as broad as it is high. The chitinous portion seems to be made of tube-like structures with cross partitions. The hydranths look like those of *Gemmaria gemmosa;* sessile, elongate when extended, with numerous short, strongly capitate tentacles arranged in more or less regular whorls.

Gonosome.—Globular or oval sporosacs, with very short pedicels, spring from the framework without regularity of position or definite relation to the nutritive zooids; greatest length 0.4 mm.

Distribution.—White Friars Islands, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Genus GEMMARIA

Gemmaria costata (Gegenbaur)

Zanclea costata GEGENBAUR, Zeit. für Wissen. Zool., Bd. VIII, 1856, p. 229.

Gemmaria costata MAYER, The Hydromedusae, I, 1910, p. 49.

Distribution.—On coral at low tide, Braithwaite Bay.

Gemmaria gemmosa McCrady

Gemmaria gemmosa MCCRADY, Gymno. Charleston Har., 1859, p. 49.

Distribution.—On sponge from reef north of Tagus Cove; on gastropod shell, Gardner Bay, 25-35 fathoms; Port Utria, 15-20 fathoms.

Anna B. Hastings has reported a species, *Zanclea protecta,* (Ann. and Mag. Nat. Hist., (5), X, 1930, pp. 552-560), from James Bay, James Island, from Gorgona Island, and from Taboga Island, but it has not been observed in this collection.

Genus SYNCORYNE

Syncoryne flexibilis, new species

Plate 2, Fig. 8

Trophosome.—Zooids growing singly from a creeping stolon; long and slender, reaching a height of 20 mm. but varying much in height; perisarc thin, hence the pedicel is not rigid; no annulations. Hydranths large, with 50 or more tentacles, more crowded than usual.

Gonosome.—Medusa-buds thickly clustered above the proximal tentacles.

Distribution.—Gorgona Island, 20 fathoms; Port Utria, on coral at low tide, in 20 fathoms and in 40 fathoms; Jicaron Island, 15 fathoms; Secas Islands, 15 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Syncoryne mirabilis (L. Agassiz)

Coryne mirabilis L. AGASSIZ, Cont. Nat. Hist. U.S., IV, 1862, p. 185.
Syncoryne mirabilis FRASER, Hyd. of Vancouver Island, 1914, p. 114.

Distribution.—Wenman Island; north shore of Tagus Cove; Black Beach; all at low tide.

Family Atractylidae

Genus BIMERIA

Bimeria gracilis Clark

Bimeria gracilis CLARK, Hyd. of Pacific Coast, 1876, p. 252.
FRASER, Hyd. of Vancouver Island, 1914, p. 115.

Distribution.—James Bay, 50-70 fathoms; Bahia Honda, low tide; South Viradores Islands, 8-10 fathoms; north of White Friars Islands, 5-10 fathoms; Isabel Island, 10-25 fathoms.

?Bimeria laxa, new species

Plate 2, Fig. 9

Trophosome.—Colonies, reaching a height of 6 cm., are fascicled in an unusual manner; there is one central tube much larger than the peripheral tubes that cover it loosely, so that much of it is exposed; this applies not only to the main stem but to the main branches, that are few in number and irregularly arranged. Short, slender branches or branchlets are given off irregularly from the main stem as well as from the branches, at an acute angle; the pedicels are short and wrinkled but not distinctly annulated. The portion of the perisarc that surrounds the base of the hydranth is rugose; hydranth small, with 9-10 tentacles.

Gonosome.—Not observed.

Distribution.—Academy Bay, 17-22 fathoms.

?Bimeria pygmaea, new species

Plate 2, Fig. 10

Trophosome.—Minute, solitary zooids, 0.4 mm. high, grow at quite regular intervals from a linear stolon, which has scarcely any branches. The perisarc on the pedicel, as well as that which grows over the base of the hydranth, is wrinkled. Tentacles 10-12.

Gonosome.—Not observed.

Distribution.—Santa Elena Bay, 8-12 fathoms.

Bimeria tenella Fraser

Bimeria tenella FRASER, California hydroids, 1925, p. 168.

Distribution.—In outer Cartago Bay, 32 fathoms.

Bimeria vestita Wright

Bimeria vestita WRIGHT, Edinburgh N.P. Jour. (N.S.), 1859, p. 109. HINCKS, British Hyd. Zoophytes, 1868, p. 103.

Distribution.—San Francisco Bay, 2 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Genus BOUGAINVILLIA

Bougainvillia crassa, new species

Plate 3, Fig. 11

Trophosome.—Stem coarse, fascicled, reaching a height of 6 cm.; branches slender as compared with the stem, some of them fascicled in the proximal portion; large branches somewhat regularly arranged, with smaller branches between less regularly placed; ultimate branchlets numerous, giving the whole colony a flabellate appearance. Stem, branches, and branchlets somewhat wrinkled but not annulated. Hydranths small, with 8-10 tentacles.

Gonosome.—Medusa-buds appear singly, attached by short pedicels to the ultimate branchlets.

Distribution.—Santa Elena Bay, at low tide, in 7-8 fathoms and in 10-12 fathoms; Port Culebra, 3-10 fathoms; Tangola-Tangola, 15-20 fathoms.

Genus PERIGONIMUS

Perigonimus repens (Wright)

Eudendrium repens WRIGHT, Proc. Roy. Phys. Soc. Edinburgh, 1858, p. 448.

Atractylis repens WRIGHT, *ibid.*, p. 450.

Perigonimus repens FRASER, Hyd. of Vancouver Island, 1914, p. 120.

Distribution.—Off Clipperton Island, 65 fathoms; Tagus Cove, 10-18 fathoms and in 70 fathoms; Post Office Bay, 10-15 fathoms; Cartago Bay, 8-12 fathoms; between Charles and Indefatigable islands, 60 fathoms; Gardner Bay, 25-35 fathoms; Santa Elena Bay, 10-12 fathoms; Port Culebra, 3-10 fathoms; Isabel Island, 10-25 fathoms; Santa Maria Bay, 10 fathoms.

?Perigonimus robustus, new species

Plate 3, Fig. 12

Trophosome.—Colony slender, unbranched, reaching a height of 60 mm. Stem continuous throughout but not very straight or rigid;

annulated or wavy throughout the whole length. Zooids given off irregularly from all sides of the stem, the pedicel of each making an acute angle with the stem; pedicel increases in diameter as it passes out so that the distal portion bears some resemblance to a hydrotheca; annulations or wrinkles close together in the proximal half or two thirds, farther apart in the distal portion. Hydranth with 9-10 tentacles.

Gonosome.—Not observed.

Distribution.—Petatlan Bay, 5-10 fathoms; Isabel Island, 10-25 fathoms.

This species looks much unlike any other species of *Perigonimus* that has been described, especially as regards size, but it seems to fit better with this genus than elsewhere and without the gonosome it cannot be placed more definitely. It is just possible that if the gonosome were known it might be necessary to place it in a new genus.

Family Eudendridae

Genus EUDENDRIUM

Eudendrium breve, new species

Plate 3, Fig. 13

Trophosome.—Individual zooids arising singly from an irregularly reticulate stolon, the hydranth with its pedicel reaching a height of 2 mm.; stolon smooth; pedicel smooth, slightly wrinkled or with few irregular annulations. Hydranths conspicuous with about 20 tentacles.

Gonosome.—Not observed.

Distribution.—Black Beach, low tide.

This species has a more extensive and more closely reticulate stolon than *E. tenellum*. It is not so slender as compared with the length of the pedicel as this species is, and the individual zooids are much more closely placed on the stolon. There were no gonophores of either sex on any of the colonies obtained.

Eudendrium capillare Alder

Eudendrium capillare ALDER, Ann. and Mag. Nat. Hist. (2), XVIII, 1856, p. 355.

FRASER, Hyd. of Vancouver Island, 1914, p. 122.

Distribution.—Pacora Island, 15-25 fathoms; Secas Islands, 25 fathoms.

Eudendrium carneum Clarke

Eudendrium carneum CLARKE, Hyd. of Chesapeake Bay, 1882, p. 137.
FRASER, Beaufort Hyd., 1912, p. 349.

Distribution.—South of Clarion Island, 50 fathoms; James Bay, 20 fathoms; between Charles and Indefatigable islands, 60 fathoms; San Francisco Bay, 2 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Eudendrium cerricaule, new species

Plate 3, Fig. 14

Trophosome.—Colony erect, reaching a length of 6 cm. The main stem is simple, straight, definitely continuous throughout the whole length of the colony, more markedly so than is commonly the case in this genus. The branches, alternate but not very regularly arranged, make a wide angle with the stem; the branchlets of the pedicels are similarly arranged on the branches. Few or no annulations on the main stem, 2-4 at the bases of the branches, branchlets, and pedicels. Hydranths with 15 or 16 tentacles.

Gonosome.—Male gonophores, single-chambered, form a loose series around the base of the hydranth, that is not aborted. Female gonophores form a series of 3 or 4 around the base of the hydranth, which is not aborted.

Distribution.—In the channel between Narborough and Albemarle islands, 70 fathoms; James Bay, 30-50 fathoms; between Charles and Indefatigable islands, 60 fathoms.

Eudendrium exiguum Allman

Eudendrium exiguum ALLMAN, Hyd. of the Gulf Stream, 1877, p. 6.

Distribution.—Gorgona Island, on coral at low tide.

Eudendrium nodosum, new species

Plate 4, Fig. 15

Trophosome.—Colonies slender, 35 mm. high; branching irregular, one or two primary branches commonly giving rise to the hydranth pedicels directly and these may all be on the one side of the branch;

hydranths also arising from the main stem; stem and main branches scarcely annulated, although there may be nodes at infrequent intervals. Pedicels with one or more annulations or wrinkles, at no definite location on the pedicel. Hydranth with about 20 tentacles.

Gonosome.—Not observed.

Distribution.—Santa Elena Bay, 10 fathoms.

Eudendrium ramosum (Linn.)

Tubularia ramosa Linnaeus, Syst. Nat., 1767, p. 1302.

Eudendrium ramosum Hincks, British Hyd. Zoophytes, 1868, p. 82.

Distribution.—Post Office Bay, on coral at low tide and in 8-10 fathoms; Bahia Honda, 15-25 fathoms; Secas Islands, 15 fathoms; Tangola-Tangola, 15-20 fathoms; north of White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Isabel Island, 10-25 fathoms; Santa Maria Bay, 35-40 fathoms; Thurloe Point, 8-10 fathoms.

Eudendrium tenellum Allman

Eudendrium tenellum Allman, Hyd. of the Gulf Stream, 1877, p.8.
Fraser, Hyd. of Vancouver Island, 1914, p. 123.

Distribution.—Off Wenman Island, 100-150 fathoms; in channel between Narborough and Albemarle islands, 70 fathoms; between Charles and Indefatigable islands, 120 fathoms; Gardner Bay, 25-35 fathoms; San Francisco Bay, 2 fathoms; Gorgona Island, 20 fathoms; Bahia Honda, 15-25 fathoms; Tangola-Tangola, 15-20 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Eudendrium tenue A. Agassiz

Eudendrium tenue A. Agassiz, N. A. Acalephae, 1865, p. 160.
Nutting, Hyd. Woods Hole, 1901, p. 333.

Distribution.—South of Clarion Island, 50 fathoms; Tagus Cove, 30 fathoms; Black Beach, near shore; north of White Friars, 5-10 fathoms.

Family Hydractinidae

Genus HYDRACTINIA

Hydractinia carolinae Fraser

Hydractinia carolinae FRASER, Beaufort Hyd., 1912, p. 351.

Distribution.—South Viradores Islands, 8-10 fathoms; Tangola-Tangola, 15-20 fathoms.

Hydractinia disjuncta, new species

Plate 4, Fig. 16

Trophosome.—Nutritive zooids small, with 10-12 tentacles, scattered over the surface of a gastropod shell, inhabited by a hermit crab.

Gonosome.—Female generative zooids much smaller than the nutritive, with the tentacles short and only four or five in number; sparsely scattered throughout the colony. Sporosacs single or in pairs, opposite (these may not be at the same stage of development), arising about half way from the base to the tentacles; ova 6-8 in number.

Male zooids not observed.

Other zooids.—No dactylozooids or sensory zooids. The spines are quite numerous; they may be almost as high as the generative zooids; smooth, slightly curved to a blunt point.

Distribution.—Jicarita Island, 30 fathoms; Port Culebra, 3-10 fathoms.

Hydractinia epispongia, new species

Plate 4, Fig. 17

Trophosome.—Colony growing over a dense calcareous sponge; nutritive zooids small, the most extended 0.6 mm. long, with 7 or 8 tentacles.

Gonosome.—Male generative zooids shorter and much more slender than the nutritive; without tentacles but the distal end much swollen, made up largely of batteries of nematocysts. Sporosacs of different sizes appear on the basal half; sometimes these are distinctly pedicellate; up to 5 in number.

Female zooids were not observed.

Other zooids.—Zooids like the generative zooids but without sporosacs are numerous in some areas. Whether they, or any of them, remain

purely offensive and defensive zooids (spiral zooids) there was no means of telling from the specimens.

Spines.—There were no spines. The individual zooids fit into cavities in the sponge skeleton and apparently need no further protection of that nature.

Distribution.—East of the islands off Navidad Head, 25-35 fathoms.

Hydractinia hancocki, new species

Plate 4, Fig. 18

Trophosome.—Colonies growing on small-ribbed gastropod shells, with the basal coenosarc forming a loose network, the meshes fitting into the sulci of the shell. There are no definite spines; sometimes closely crowded, there are brown spheroidal bodies, looking like the basal bodies of real spines. In some colonies, however, none of these was observed. The nutritive zooids are slender, reaching a height of 1.8 mm. The tentacles are few in number, 12-16, arranged in one irregular series.

Gonosome.—The generative zooids are smaller than the nutritive, and the tentacles are reduced in number, commonly 4. The male gonophores vary in number, up to 7, placed some distance proximal to the tentacles, not in a regular series. The female sporosacs are placed similarly to those in the male and are even more irregular in position. The ova are few, with 6 as a maximum.

Other zooids.—None observed.

Distribution.—Black Beach, at low tide; Post Office Bay, 12-15 fathoms; Stephens Bay, 32 fathoms; west of South Seymour Island, 5 fathoms; Sulivan Bay, 6 fathoms; Cartago Bay, 8-12 fathoms; between Charles and Indefatigable islands, 60 fathoms; Gardner Bay, 20 fathoms.

Hydractinia longispina, new species

Plate 4, Fig. 19

Trophosome.—Colony growing from a basal coenosarc, consisting of a close network from which arise several elongated spines. The nutritive zooids are long, 3 mm., but rather slender, with numerous (30 or more) long, slender tentacles, not definitely arranged in series.

Gonosome.—The generative zooids are but slightly reduced in size, if at all; the number of tentacles varies but there is seldom more than half of the number found on the nutritive zooids. The sporosacs are

situated about midway up on the hydrocaulis. The male sporosacs are few, arranged in an irregular series. The large female sporosacs are much more numerous in a somewhat irregularly crowded series; the ova in each sporosac are numerous, but because the sporosacs are so large the ova are still quite large.

Other zooids.—None observed.

Spines.—The elongated spines or, more properly speaking, tubes, since they do not seem to be closed at the slightly tapered distal end, are smooth, 1.5 mm. long; some of them shorter, seem to be broken off.

Distribution.—Tagus Cove, 10-18 fathoms; Post Office Bay, 8-10 fathoms.

Hydractinia multispina, new species

Plate 4, Fig. 20

Trophosome.—Large colonies growing from basal coenosarc, made up of a network so close that it is practically continuous. The nutritive zooids are large for the genus, as much as 3.5 mm. long when contracted. The tentacles are numerous, 36, in two quite definite series.

Gonosome.—Although colonies were obtained from four localities, they were all female. The generative zooids are somewhat smaller than the nutritive, and the tentacles are reduced in number, 12-15. The sporosacs are few, 4 or 5, attached just proximal to the tentacles, with a few, not more than 8, ova in each.

Other zooids.—None observed.

Spines.—From the coenosarcal base arise numerous smooth spines, nearly cylindrical but tapering slightly to a blunt tip, most of them about 0.6 mm. in length but some of them slightly longer.

Distribution.—On large shells between Charles and Indefatigable islands, 60 fathoms; Post Office Bay, 10 fathoms and 12-15 fathoms; Black Beach, low tide.

Hydractinia polycarpa, new species

Plate 5, Fig. 21

Trophosome.—Nutritive zooids in greatest extension 1.8 mm., with 8-10 tentacles.

Gonosome.—Female generative zooids, shorter, 1.0 mm., and more slender than the nutritive zooids; no tentacles; the distal end is somewhat swollen and is well provided with nematocysts; the swollen end is much darker than the rest of the zooid, a dark brown, almost a

black, in some of the preserved specimens. Sporosacs numerous, as many as 10, forming a dense cluster around the distal half of the zooid; 2 to 4 ova in each sporosac.

No male specimens were obtained.

Other zooids.—Dactylozooids numerous, forming almost a continuous row in some places at the margin of the colony.

Spines.—Spines are numerous, rather small, slender, tapering to the point, slightly rough at the margins.

Distribution.—Santa Elena Bay, 7-12 fathoms.

Hydractinia quadrigemina, new species

Plate 5, Fig. 22

Trophosome.—Colony growing on the surface of a gastropod shell; largest nutritive zooids 2.5 mm., with 15 or 16 tentacles.

Gonosome.—Female generative zooids somewhat smaller than the nutritive, with tentacles well developed but not numerous, 6-8. Usually there is but one sporosac, although a small one may appear opposite the fully developed one, a short distance below the base of the tentacles. Sporosacs large, spherical, with four large ova.

No male specimens observed.

Other zooids.—None observed.

Spines.—The spines are conspicuous but not very numerous; they may reach a length of nearly 1.0 mm.; smooth, tapering very gradually, slightly curved.

Distribution.—Off Isabel Island, 10-25 fathoms.

Genus **PODOCORYNE**

Podocoryne reticulata, new species

Plate 5, Fig. 23

Trophosome.—Individual zooids arise from a stolon that follows the groove between successive whorls in the shell of a gastropod; the whorls are ribbed and cross connections of the stolon lie almost entirely in the sulcus formed by the ribbing. The nutritive zooids are small, about 0.7 mm., with 10-12 tentacles.

Gonosome.—The generative zooids are but little smaller than the nutritive zooids and the number of tentacles is but slightly reduced, 6 or 7. The medusa-buds are borne just below the tentacles; there is

commonly but one bud to a zooid, but often two, seldom more. Occasionally a bud is borne directly on the stolon.

Other zooids.—None observed. No spines.

Distribution.—Santa Elena Bay, 8-12 fathoms.

The protection given by the ribbing of the shell makes the usual calcareous deposits on the stolon unnecessary.

Family Pennaridae

Genus PENNARIA

Pennaria tiarella McCrady

Pennaria tiarella McCRADY, Gymnoph. of Charleston Har., 1859, p. 51.
FRASER, Beaufort Hyd., 1912, p. 355.

Distribution.—North shore, Wenman Island, low tide; Post Office Bay, 12-15 fathoms; Santa Elena Bay, 5-12 fathoms; San Francisco Bay, 2 fathoms; Port Culebra, low tide.

Family Cladocorynidae

Genus CLADOCORYNE

Cladyocoryne pelagica Allman

Cladocoryne pelagica ALLMAN, Linn. Soc. Jour., 1876, p. 255.

Distribution.—Braithwaite Bay, on coral at low tide; Santa Elena Bay, 10-12 fathoms.

Family Tubularidae

Genus TUBULARIA

Tubularia sp.

Trophosome.—Several young tubularians were scattered over a gastropod shell, none of them more than 2 mm. high and most of them less than 1.5 mm. The light-colored perisarc is heavy enough to give the zooid a rigid appearance; it is smooth and ends abruptly some short distance below the base of the hydranth, the exposed portion being much more slender than the portion within the perisarc. The basal tentacles are 14 or less and the oral tentacles 10 or less in number.

Gonosome.—None of the zooids was mature.

Distribution.—Santa Elena Bay, 8-12 fathoms.

These specimens seem unlike any other American species of this genus but as they are immature it does not seem advisable to give them a name.

Tubularia crocea (Agassiz)

Parypha crocea Agassiz, Contr. Nat. Hist. U.S., IV, 1862, p. 249.

Tubularia crocea Fraser, Hyd. of Vancouver Island, 1914, p. 127.

Distribution.—Tagus Cove, in 30 fathoms and on coral and sponges at low tide; Jicaron Island, 30 fathoms.

Tubularia integra, new species

Plate 5, Fig. 24

Trophosome.—Individual zooids growing singly, at irregular intervals from a loosely reticulate stolon, reaching a height of 25 to 30 mm. The stolon is slightly annulated but the pedicels are entirely smooth, tapering slightly to a greater diameter at the base of the hydranth; somewhat swollen just proximal to the constriction where the support of the hydranth takes place. The basal tentacles, 25-32 in number, are long and slender as compared with the proximal that are short and stout for their length; they are much fewer, 8-12.

Gonosome.—Gonophores appear on short processes, sometimes almost sessile; there are four well-separated, but very low, tentacular processes.

Distribution.—Stephens Bay, 35 fathoms; west of South Seymour Island, 5 fathoms; Pacora Island, 15-25 fathoms; Medidor Island, at low tide on coral.

Tubularia multitentaculata, new species

Plate 6, Fig. 25

Trophosome.—Solitary zooids are large, up to 2 cm., with a heavy brown perisarc covering the pedicel except for a short distance at the distal end. Hydranth large, with 20-24 long proximal tentacles and very numerous, up to 100, distal tentacles.

Gonosome.—Gonophores with a tendency to form clusters, but the pedicels are short and unbranched; the radial canals show distinctly; when mature, they are large, 1.3 mm. in length. The distal end is not

provided with tentacular processes, although when the actinulae are partly dehisced, that gives the appearance of distal processes.

Distribution.—Thurloe Point, on gorgonids, 8-10 fathoms; South Bay, Cerros Island, also on gorgonids, 10-15 fathoms.

Suborder CALYPTOBLASTEA

Family Bonneviellidae

Genus BONNEVIELLA

Bonneviella minor, new species

Plate 7, Fig. 26

Trophosome.—Zooids arising singly from a loosely spreading stolon, which does not form a very definite network. Pedicels short, not as long as the hydrothecae, without annulations or corrugations. Hydrothecae almost tubular, 1.4 mm. long, 0.5 mm. in diameter, with a distinctly flaring margin. It has much the appearance of that of *B. regia,* but is only about half as long and half as wide.

Gonosome.—Not observed.

Distribution.—In the channel between Narborough and Albemarle islands, 70 fathoms.

Family Campanularidae

Genus CAMPANULARIA

?Campanularia emarginata, new species

Plate 7, Fig. 27

Trophosome.—Zooids arise singly from a stolon that does not form a network; at times, this stolon seems to form a loose fascicle; total height 4 mm., of which the hydrotheca takes 1.1 or 1.2 mm. Pedicels with no annulations except two, immediately proximal to the hydrotheca. Hydrotheca twice, or nearly so, as long as it is broad, cylindrical in its distal half, gradually rounding to the base. Margin with 12 blunt, distinctly cut teeth, each tooth emarginate.

Gonosome.—Not observed.

Distribution.—On *Antennularia,* La Plata Island, 45-55 fathoms.

?Campanularia gracilicaulis, new species

Plate 7, Fig. 28

Trophosome.—Individual zooids arise from a meandering stolon, which is slender and smooth; the individual pedicels are long and

slender, up to 5 mm., so that they stand out conspicuously from the supporting surface; they are not annulated directly at the base, but a short distance from the base there are numerous annulations; some distance distal to these there is a smaller number, and two or three near the distal end, next the hydrotheca. Hydrotheca broadly campanulate, with 10 rather shallow, rounded teeth at the margin. Lines run backward from the indentations between the teeth.

Gonosome.—Not observed.

Distribution.—West of South Seymour Island, 5 fathoms.

Campanularia hincksi Alder

Campanularia hincksi Alder, Ann. and Mag. Nat. Hist., (2), XVIII, 1856, p. 360.

Hincks, Br. Hyd. Zooph., 1868, p. 162.

Distribution.—East of islands off Navidad Head, 25-35 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Campanularia urceolata Clark

Campanularia urceolata Clark, Alaskan Hyd., 1876, p. 215.

Fraser, Hyd. of Vancouver Island, 1914, p. 140.

Distribution.—East of islands off Navidad Head, 25-35 fathoms.

Campanularia volubilis (Linn.)

Sertularia volubilis Linnaeus, Syst. Nat., 1767, p. 1311.

Campanularia volubilis Fraser, Hyd. of Vancouver Island, 1914, p. 141.

Distribution.—Black Beach, low tide; White Friars Islands, 25 fathoms.

Genus CLYTIA

Clytia acutidentata, new species

Plate 7, Fig. 29

Trophosome.—Colony small, reaching a height of 6 mm., not definitely branched. The stem is geniculate in such a way that each pedicel

in succession seems to terminate the stem, while the offshoot becomes the main stem for the next internode; the angle between the offshoot and the stem is so small that the general direction of the growth of the colony is but little changed. In no case are there more than 7 or 8 zooids in the colony, and there may be only 1 or 2. The main stem has several annulations at the base, the short pedicels are annulated throughout and the larger pedicels, proximally and distally. The hydrotheca is broadly campanulate with 10 acute teeth on the margin. A line runs backward from the tip of each tooth a short distance toward the base of the hydrotheca.

Gonosome.—Gonangium arising from the stolon, with little indication of a pedicel, smooth, with a short distal collar.

Distribution.—Post Office Bay, on coral at low tide; north of White Friars Islands, on coral in 5 fathoms.

Clytia attenuata (Calkins)

Campanularia attenuata CALKINS, Hyd. of Puget Sound, 1899, p. 350.

Clytia attenuata FRASER, Hyd. of Vancouver Island, 1914, p. 142.

Distribution.—Tagus Cove, on coral at low tide.

?Clytia carinadentata, new species

Plate 7, Fig. 30

Trophosome.—Colony small, slender, 5 mm. high; no branches, not even a continuous stem. The basal portion continues to form the pedicel for the proximal zooid; a short distance proximal to the base of the hydrotheca another stem is given off, forming a pronounced knee at its origin; this continues to form the pedicel of the second zooid, and this may give off a third in the same way, except that the distal portion (in this case, the pedicel for the third zooid) does not give off any stem or pedicel.

The original stem is annulated at the base, a short distance proximal to the point where the next one has its origin, and immediately below the hydrotheca; the intermediate stem is annulated at the base and below the base of the hydrotheca as is the terminal one. The hydrotheca is nearly tubular, 1.0 mm. long, 0.5 mm. wide; the margin is provided with 12-14 acute teeth, each of which is distinctly keeled,

the keel extending backward a short distance toward the base of the hydrotheca.

Gonosome.—Not observed.

Distribution.—Off the northeast point of Albemarle Island, low tide.

Clytia coronata (Clarke)

Campanularia coronata CLARKE, Bull. Mus. Comp. Zool., Harvard, 1879, p. 242.

Clytia coronata FRASER, Beaufort Hyd., 1912, p. 357.

Distribution.—Pacora Island, 15-25 fathoms; Tangola-Tangola, 15-20 fathoms.

Clytia cylindrica Agassiz

Clytia cylindrica AGASSIZ, Contr. Nat. Hist. U.S., IV, 1862, p. 306.
FRASER, Hyd. of Vancouver Island, 1914, p. 142.

Distribution.—Off Clipperton Island, 65 fathoms; off Albemarle Point, on *Sargassum;* Tagus Cove, on corals and sponges at low tide and in 30 fathoms; Black Beach, low tide; San Francisco Bay, 2 fathoms; Pacora Island, 15-25 fathoms; Bahia Honda, 15-25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Clytia edwardsi (Nutting)

Campanularia edwardsi NUTTING, Hyd. Woods Hole, 1901, p. 346.

Clytia edwardsi FRASER, Hyd. of Vancouver Island, 1914, p. 143.

Distribution.— Between Narborough and Albemarle islands, 70 fathoms; Santa Maria Bay, 10 fathoms; off Thurloe Point, 8-10 fathoms.

Clytia fascicularis, new species

Plate 7, Fig. 31

Trophosome.—Hydrothecae often arising single from a stolon, with a pedicel annulated proximally and distally, but often the pedicels are clustered to form a loose fascicle, with a total height of 5 mm., in which case the part of the pedicel that is free from the fascicle is short

and entirely annulated. Hydrotheca cylindrical, the base broadening to full width immediately as it leaves the pedicel, large, 0.7 mm. by 0.4 mm. The margin is supplied with 10 blunt but deeply cut teeth.

Gonosome.—The gonangium is attached to the stolon by a short pedicel; it is obovate, with the distal end truncate; slightly corrugated; 1.0 mm. by 0.4 mm.

Distribution.—Santa Elena Bay, 8-12 fathoms; Port Utria, on coral at low tide; Tangola-Tangola, on coral at low tide; east of islands off Navidad Head, 25-35 fathoms; Isabel Island, 10-25 fathoms.

Clytia inconspicua (Forbes)

Thaumantias inconspicua FORBES, Br. Naked-eyed Medusae, 1848, p. 52.

Clytia inconspicua FRASER, Hyd. of Vancouver Island, 1914, p. 144.

Distribution.—Jicaron Island, 15 fathoms.

Clytia irregularis, new species

Plate 8, Fig. 32

Trophosome.—Colony, 8 mm., unbranched or slightly branched, sometimes slightly fascicled toward the base; each branch similar to a portion of the main stem. Hydrothecae given off irregularly, with a decided "knee" on the pedicel as it leaves the stem. Pedicels vary much in length; the short ones may be annulated throughout, but the longer ones are partly free from annulations, there being more of them toward the distal than toward the proximal end; annulations on the main stem just distal to the node. Hydrotheca approximately one third longer than wide, definitely campanulate; margin with 12 deeply incised, sharp teeth.

Gonosome.—Gonangia single or in pairs, given off from the main stem or branch, at the node; the base tapers to a point and it can scarcely be said that there is a pedicel. There is an increase in diameter until a constriction is reached just below the margin. The whole gonangium, which is smooth, may be regularly and distinctly curved; the distal end is truncated, with a small opening centrally placed. The medusa-buds are somewhat longer than broad.

Distribution.—Tangola-Tangola, on coral slightly below low tide; off White Friars, in 5-10 and in 25 fathoms.

Clytia johnstoni (Alder)

Campanularia johnstoni Alder, Ann. and Mag. Nat. Hist., (2), XVIII, 1856, p. 359.

Clytia johnstoni Hincks, Br. Hyd. Zoophytes, 1868, p. 143.

Distribution.—Gorgona Island, low tide; Tangola-Tangola, on coral at low tide; east of islands off Navidad Head, 25-35 fathoms.

Clytia kincaidi (Nutting)

Campanularia kincaidi Nutting, Hyd. of Alaska and Puget Sound, 1899, p. 743.

Clytia kincaidi Fraser, Hyd. of Vancouver Island, 1914, p. 146.

Distribution.—Wenman Island, low tide; Tagus Cove, 30 fathoms; between Narborough and Albemarle islands, 70 fathoms; between Charles and Indefatigable islands, 60 fathoms; Tangola-Tangola, 15-20 fathoms; north of White Friars, 25 fathoms; off Tenacatita Point, 10 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Clytia longicyatha (Allman)

Obelia longicyatha Allman, Mem. Mus. Comp. Zool., Harvard, 1877, p. 10.

Clytia longicyatha Fraser, Beaufort Hyd., 1912, p. 359.

Distribution.—Port Utria, 20 fathoms; Jicaron Island, 25-30 fathoms; Secas Islands, 15 fathoms; Tangola-Tangola, 15-20 fathoms; Isabel Island, 10-25 fathoms; Santa Maria Bay, 35-40 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Clytia longitheca Fraser

Clytia longitheca Fraser, Hyd. of Vancouver Island, 1914, p. 137.

Distribution.—Tangola-Tangola, 15-20 fathoms.

?Clytia multidentata, new species

Plate 8, Fig. 33

Trophosome.—Individual zooids grow in a loose cluster; pedicels 2.5 mm. long; annulations at the base of the hydrotheca, otherwise smooth. Hydrotheca gradually increasing in diameter from base to

margin; length 1.0 mm., greatest breadth 0.5 mm.; margin with 16-18 slender, blunt, deeply cut teeth; distinct lines running backward from the spaces between the teeth.

Gonosome.—Not observed.

Distribution.—Port Utria, 20 fathoms.

Clytia raridentata (Alder)

Plate 8, Fig. 34

Campanularia raridentata ALDER, Ann. and Mag. Nat. Hist. (3), IX, 1862, p. 315.
FRASER, Hyd. of Vancouver Island, 1914, p. 138.

Trophosome.—Stems unbranched, serving for the pedicels of the hydranths, arising from a stolon, which at this point has a distinct elevation, somewhat bulbous in appearance; pedicel annulated at the base and below the hydrotheca and sometimes more or less throughout. Hydrotheca long and narrow, tapering slightly from margin to base; teeth usually 5 in number, deep and rounded at the tip.

Gonosome.—(Not previously described.) Gonangium arising from the stolon, with scarcely any pedicel; from the base it increases in diameter gradually toward the middle and then decreases almost imperceptibly until it suddenly enlarges at the distal end to form a definite flare, truncated, without a collar. The opening is about half of the diameter of the distal end; surface smooth.

Distribution.—Braithwaite Bay, 16-18 fathoms; Tangola-Tangola, at low tide and in 15-20 fathoms.

? Clytia seriata, new species

Plate 8, Fig. 35

Trophosome.—Colony 20 mm., usually unbranched, consisting of a series of zooids—8 in the colony described—rather than a stem, from which zooids are given off at intervals. The pedical of each zooid, with the exception of the basal, has its origin a short distance below the hydrotheca of the zooid immediately preceding it, with a definite "knee" at the base, so that the successive pedicels are not far from being in a straight line; the pedicel has several annulations, proximally and distally. Occasionally a colony appears with a branch given off in much the same way as the pedicel, and it continues in a similar way to the

main portion. The hydrotheca is situated like an inverted, truncated cone, with a very evident diaphragm; margin entire.

Gonosome.—Gonangium arising from near the middle of a pedicel, with scarcely any pedicel of its own, but turning to pass in the same direction as the hydranth pedicel; elongated, obovate, rounded at the distal end, without a terminal collar. The only gonangium observed was empty.

Distribution.—Tangola-Tangola, near shore in 15-20 fathoms.

Genus EUCOPELLA

Eucopella everta (Clark)

Campanularia everta CLARK, Hyd. of the Pacific Coast, 1876, p. 253.

Eucopella everta FRASER, West Coast Hyd., 1911, p. 37.

Distribution.—Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Eucopella minor, new species

Plate 8, Fig. 36

Trophosome.—Zooids arising singly from a stoloniferous network; height 1.0 mm., the pedicel 0.6 mm., and the hydrotheca 0.4 mm. Pedicel corrugated or slightly annulated throughout; a distinctly spherical portion appears directly below the hydrotheca. Hydrotheca with thick wall, width 0.3 mm., scarcely flaring, nearly tubular, with 12 low, rounded teeth forming a crenate margin.

Gonosome.—Gonangium arising directly from the stolon with a short pedicel, 1.25 mm. by 0.6 mm., nearly smooth, slightly obovate, with the distal end truncate. One large medusoid structure occupies most of the space within; in some cases, an indication of a second one appears.

Distribution.—Santa Elena Bay, on floating *Sargassum*.

Genus GONOTHYRAEA

Gonothyraea clarki (Marktanner)

Laomedea (Gonothyraea) clarki MARKTANNER-TURNERESCHER, Hyd. von Ost Spitzbergen, 1895, p. 408.

Gonothyraea clarki FRASER, Hyd. of Vancouver Island, 1914, p. 148.

Distribution.—South of Clarion Island, 50 fathoms.

Gonothyraea gracilis (Sars)

Laomedea gracilis SARS, Beretning om en Zool. Reise i Lofoten og Finmarken, 1851, p. 18.

Gonothyraea gracilis FRASER, Hyd. of Vancouver Island, 1914, p. 148.

Distribution.—Braithwaite Bay, 30 fathoms; Tagus Cove, 30 fathoms; Post Office Bay, 10-15 fathoms; James Bay, 50-70 fathoms; Cartago Bay, 32 fathoms; between Charles and Indefatigable islands, 60 fathoms; La Plata Island, 45-55 fathoms; Port Utria, 15-20 fathoms; Tangola-Tangola, 15-20 fathoms; off White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Isabel Island, 10-25 fathoms.

Gonothyraea serialis, new species

Plate 8, Fig. 37

Trophosome.—Zooids arising singly from the stolon, or with a succession of three or four, the second arising from the pedicel of the first, the third arising from the pedicel of the second, et cetera, in each case, somewhat nearer the distal end than the proximal; highest colony observed, 6 mm. Each pedicel has several annulations at or near each end; each pedicel forms a definite "knee" at its origin. The diameter of the hydrotheca gradually becomes greater from base to margin; length 0.7 to 0.75 mm., breadth 0.4 mm. Margin with 12 sharp teeth, distinctly but not deeply cut; each tooth has a distinct ridge which continues back on the hydrotheca as a distinct line.

Gonosome.—Gonangia arising from the axils of the pedicels, or from the stolon, with a short pedicel which has one or two annulations; obovate, truncate, with a narrow but distinct collar.

Distribution.—On a *Lytocarpus* stem at low tide, Port Utria; Bahia Honda, 15-25 fathoms.

Genus OBELIA

Obelia alternata, new species

Plate 8, Fig. 38

Trophosome.—Colony small and delicate, with a maximum length of 5 or 6 mm., most of the colonies much shorter than this. Stem flexuous, alternating to the one side and the other; very occasionally there is a single branch; the pedicel of each hydrotheca appears to be a continuation of the preceding internode of the stem, bending outward or

even slightly backward in the distal portion; two or three annulations at the base of each internode; pedicels, except the terminal one that is annulated at each end, are annulated throughout. Hydrotheca small, broadly campanulate, slightly flaring at the margin, which is supplied with 10 rounded, comparatively shallow teeth.

Gonosome.—Gonangia arising from the axils of the hydrothecal pedicels, obovate, with a terminal opening but without a definite collar.

Distribution.—Post Office Bay, 12-15 fathoms; west of South Seymour Island, 5 fathoms.

This species resembles *O. dichotoma* in its mode of growth, but the colonies are, in general, much smaller, and the hydrothecae are quite dissimilar.

Obelia articulata (A. Agassiz)

Eucope articulata A. Agassiz, N. A. Acalephae, 1865, p. 89.

Obelia articulata Fraser, Hyd. of Eastern Canada, 1918, p. 348.

Distribution.—Between Charles and Indefatigable islands, 60 fathoms.

Obelia commissuralis McCrady

Obelia commissuralis McCrady, Gymno. Charleston Har., 1859, p. 95. Nutting, American Hyd., Part III, 1915, p. 83.

Distribution.—Bahia Honda, 15-25 fathoms; Tangola-Tangola, 15-20 fathoms.

Obelia dichotoma (Linn.)

Sertularia dichotoma Linnaeus, Syst. Nat., 1758, p. 812.

Obelia dichotoma Hincks, Br. Hyd. Zoophytes, 1868, p. 156.

Distribution.—Tagus Cove, on coral and sponges at low tide; Santa Elena Bay, on drifting *Sargassum;* Tangola-Tangola, 15-20 fathoms; north of White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Obelia equilateralis, new species

Plate 9, Fig. 39

Trophosome.—Colony small, simple, unbranched, reaching a height of 6 or 7 mm. Stem irregularly geniculate, annulated at the proximal end of the internodes. Hydrothecae irregularly arranged on long pedi-

cels that are annulated below the base of the hydrothecae and sometimes at the proximal end as well. Hydrothecae, in face view, almost equilaterally triangular. Margin entire, without flare.

Gonosome.—Gonangium large, 1.4 mm. long, growing directly from the stem between the nodes; smooth, elliptical or slightly obovate; opening small, terminal; no collar.

Distribution.—Santa Elena Bay, 8-12 fathoms.

Obelia geniculata (Linn.)

Sertularia geniculata LINNAEUS, Syst. Nat., 1767, p. 1312.

Obelia geniculata HINCKS, Br. Hyd. Zoophytes, 1868, p. 149.

Distribution.—Braithwaite Bay, 16-18 fathoms; Tagus Cove, low tide; reef north of the entrance to Tagus Cove, low tide.

Obelia hyalina Clarke

Obelia hyalina CLARKE, Bull. Mus. Comp. Zool., Harvard, 1879, p. 241.

FRASER, Beaufort Hyd., 1912, p. 363.

Distribution.—East of islands off Navidad Head, 25-35 fathoms; Santa Maria Bay, 10 fathoms; Thurloe Point, low tide; South Bay, Cerros Island, 10-15 fathoms.

Obelia microtheca, new species

Plate 9, Fig. 40

Trophosome.—Colony small, slender, reaching a height of 4 mm., but usually much less. Hydrothecae quite regularly alternate, with a tendency to geniculation. Pedicels 1-2 times as long as the hydrothecae. Stem annulated above the origin of each pedicel; pedicel annulated in at least the distal half. Hydrothecae nearly equal in breadth and length; small, 0.2 mm. Margin entire.

Gonosome.—Gonangium resembling that of *O. dichotoma,* arising with a short pedicel from the axil of the hydrothecal pedicel, 0.5-0.6 mm. in total length; a definite collar much smaller than the distal portion of the gonangium.

Distribution.—Santa Elena Bay, 10 fathoms.

Obelia obtusidens (Jäderholm)

Plate 9, Fig. 41

Campanularia obtusidens JÄDERHOLM, Hyd. aus den Küsten von Chile, 1904, p. 2.

Trophosome.—Colony simple, reaching a height of 3 cm. Stem slightly geniculate; in larger colonies there are regularly alternating branches, in smaller colonies there may be none. Stem quite extensively annulated in the proximal portion of each internode; short pedicels annulated throughout, longer ones, in proximal and distal portions. Hydrothecae broadly campanulate, almost as broad as long; margin with 12 low, rounded teeth; lines pass backward along the hydrothecae from the indentations.

Gonosome.—(Not previously described.) Gonangium arising directly from the stolon, with a short pedicel, not annulated, smooth, broad at the distal end and tapering rather rapidly at the proximal end. There is a distinct collar. Length 0.75 mm., greatest breadth 0.2 mm.

Distribution.—Santa Elena Bay, 10-12 fathoms.

Obelia plicata Hincks

Obelia plicata HINCKS, Br. Hyd. Zoophytes, 1868, p. 154.
FRASER, Hyd. of Vancouver Island, 1914, p. 154.

Distribution.—South of Clarion Island, 50 fathoms; James Bay, 50-70 fathoms; Cartago Bay, 32 fathoms; between Charles and Indefatigable islands, 60 fathoms; La Plata Island, 45-55 fathoms; Gorgona Island, 20 and 150 fathoms; Port Utria, 40 fathoms; Jicaron Island, 25-30 fathoms; Pacora Island, 15-25 fathoms; Santa Maria Bay, 35-40 fathoms.

Obelia tenuis, new species

Plate 9, Fig. 42

Trophosome.—Colony small; sometimes there is a single hydrotheca and pedicel but usually there is a short geniculate stem, giving off up to four hydrothecae in which case it may reach a height of 2 mm. The hydrotheca is borne on a short, annulated, or partly annulated pedicel (the internodes of the stem are annulated toward the proximal end); it appears to be an elongation of the pedicel, broadening gradually but not extensively to the margin; the margin has 8 rounded teeth; defi-

nite lines run from the indentations between the teeth backward toward the base.

Gonosome.—Gonangia arising singly or in pairs from the hydrothecal axils, small and slender for their length, 0.7 mm. long, 0.1 mm. in diameter, tubular, some of them with a definite collar at the distal end. The distal half may be slightly annulated or corrugated. The blastostyle is present in the basal portion only; the medusa-buds are liberated from the end of this to form a single linear series in the gonangium. Medusa with 12 tentacles at time of liberation from the gonangium.

Distribution.—Santa Elena Bay, low tide to 12 fathoms; off Morro de Petatlan, 10-15 fathoms; off Tenacatita Point, 10 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Genus SILICULARIA

Silicularia pedunculata (Jäderholm)

Campanularia pedunculata JÄDERHOLM, Archives de Zool. Exper. et Gen. (4), III, 1904, p. vi.

Silicularia divergens HARTLAUB, Die Hyd. der magalhaensischen Region, 1905, p. 578.

Silicularia pedunculata JÄDERHOLM, Hyd. aus Ant. Meere, 1905, p. 18.

Distribution.—It is difficult to believe that this South Georgia and Tierra del Fuego species would inhabit the Secas Islands area, but the trophosome (no gonosome is present in the specimens) agrees so exactly with Jäderholm's description and figures that it is impossible to ignore the resemblance.

Family Campanulinidae

Genus CAMPANULINA

?Campanulina ramosa, new species

Plate 9, Fig. 43

Trophosome.—Colony small, largest 7 mm., for the size of it, extensively branched dichotomously; entirely without annulations or with but slight indications of such. Hydrotheca with 10 segments in the operculum.

Gonosome.—Not observed.

Distribution.—Tagus Cove, 30 fathoms; between Charles and Indefatigable islands, 60 fathoms.

Genus CUSPIDELLA

Cuspidella humilis (Alder)

Campanularia humilis ALDER, Trans. Tynes. Nat. F.C., 1863, p. 239.

Cuspidella humilis FRASER, Hyd. of Vancouver Island, 1914, p. 159.

Distribution.—Port Utria, 40 fathoms; Isabel Island, 10-25 fathoms.

Genus LOVENELLA

Lovenella nodosa, new species

Plate 9, Fig. 44

Trophosome.—Stem slender, straight, unbranched, reaching a height of 35 mm. Hydrothecae given off regularly, alternate, gradually getting slightly closer together as they are farther from the base. Two, or occasionally three, nodes between successive hydrothecae near the base, but sometimes only one, just distal to the hydrotheca pedicel, in the distal portion. Pedicels longer near the base, with several annulations that look like nodes, shorter in the distal portion, with only one annulation. Hydrotheca turbinate, large, over 1.0 mm. in length from the base of the operculum to the base of the hydrotheca, 0.5 mm. wide at the base of the operculum; operculum of 8 segments, 0.4 mm. in length. Hydranth with 14-15 tentacles.

Gonosome.—Gonangia arising from the pedicel of the hydrotheca, with a short pedicel, having one annulation; slender, almost tubular, but tapering slightly to the base; reaching slightly beyond the base of the operculum of the corresponding hydrotheca; truncated at the distal end. Six developing medusoids within the gonangium.

Distribution.—Santa Elena Bay, 7-8 fathoms; off Morro de Petatlan, 25 fathoms; off Tenacatita Point, 10 fathoms; Isabel Island, 10-25 fathoms; off Thurloe Point, 30 fathoms.

Lovenella producta (Sars)

Calycella producta SARS, Norges Hydroider, 1873, p. 30.

Lovenella producta FRASER, Hyd. of Vancouver Island, 1914, p. 159.

Distribution.—La Plata Island, 45-55 fathoms.

This species closely resembles *Egmundella gracilis* Stechow but has none of the nematophores that are present in that species.

Family Halecidae

Genus ENDOTHECIUM

Endothecium reduplicatum Fraser

Endothecium reduplicatum FRASER, Some Japanese Hyd., 1935, p. 107.

Distribution.—Bahia Honda, 15-25 fathoms; off White Friars, 25 fathoms.

Genus HALECIUM

Halecium articulosum Clark

Halecium articulosum CLARK, New England Hydroids, 1876, p. 63.
FRASER, Hyd. of Vancouver Island, 1914, p. 164.

Distribution.—South Bay, Cerros Island, 10-15 fathoms.

Halecium beani (Johnston)

Thoa beani JOHNSTON, Br. Zoophytes, 1847, p. 120.

Halecium beani HINCKS, Br. Hyd. Zoophytes, 1868, p. 224.

Distribution.—Tagus Cove, 30 fathoms; James Bay, 50-70 fathoms; between Charles and Indefatigable islands, 60 fathoms; off Black Beach, 25-40 fathoms; Gardner Bay, 25-35 fathoms; Santa Elena Bay, 10-12 fathoms; San Francisco Bay, 2 fathoms; Tangola-Tangola, 15-20 fathoms; off White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Halecium bermudense Congdon

Halecium bermudense CONGDON, Hyd. of Bermuda, 1907, p. 473.
FRASER, Beaufort Hyd., 1912, p. 367.

Distribution.—Between Charles and Indefatigable islands, 60 fathoms.

Halecium corrugatum Nutting

Halecium corrugatum NUTTING, Hyd. from Alaska and Puget Sound, 1899, p. 745.
FRASER, Hyd. of Vancouver Island, 1914, p. 164.

Distribution.—Santa Maria Bay, in 10 fathoms and in 35-40 fathoms.

Halecium fasciculatum, new species

Plate 10, Fig. 45

Trophosome.—Colony 30 mm.; main stem and larger branches fascicled for some distance; branches few and irregularly placed; simple portion of stem and branches strongly geniculate. Each internode seems to terminate in a hydrophore, which is often reduplicated; the succeeding internode is given off near the distal end, and it, in turn, ends in a hydrophore; this is continued throughout the whole length. There are two annulations at the proximal end of each internode. The rim of the hydrophore is distinctly flaring. Several of the hydrophore pedicels have a large circular opening just proximal to the hydrophore.

Gonosome.—Gonangium arising by a short, stout pedicel, from the hydrophore pedicel, is broadly lenticular. Each side of the lens is strongly marked by 5 longitudinal corrugations. (The contents of the gonangia were not in good enough condition to determine the sex.)

Distribution.—Between Charles and Indefatigable islands, 60 fathoms.

Halecium flabellatum Fraser

Halecium flabellatum Fraser, Some Japanese Hyd., 1935, p. 108.

Distribution.—Tangola-Tangola, 15-20 fathoms.

These specimens agree entirely with the specimens from Japan except that the gonangia are devoid of terminal nodules.

Halecium gracile Verrill

Halecium gracile Verrill, Invert. An. Vineyard Sound, 1874, p. 729.
Nutting, Hyd. Woods Hole, 1901, p. 358.

Distribution.—Bahia Honda, low tide; South Viradores Islands, 8-10 fathoms; off White Friars, 25 fathoms, and in 5-10 fathoms.

Halecium halecinum (Linn.)

Sertularia halecina Linnaeus, Syst. Nat., 1767, p. 1308.

Halecium halecinum Fraser, Hyd. of Vancouver Island, 1914, p. 165.

Distribution.—San Francisco Bay, 3-8 fathoms; Tangola-Tangola, 15-20 fathoms; Isabel Island, 10-25 fathoms.

Halecium insolens, new species

Plate 10, Fig. 46

Trophosome.—Colony minute, slender, up to 1.5 mm. in height, growing from a loose stoloniferous network. There may be a single hydrophore with a rather long pedicel, but in most cases others have been added. The second pedicel grows from the first just below the hydrophore and, near its base, turns so that it is almost in the same direction as the first; the third pedicel bears a similar relation to the second, and there may be four or five in the same one-sided series, for each in succession appears on the same side as the previous one, although there may be a little spiral twisting. Occasionally one or more branches are given off, but these are all also on the one side of the stem. There are one or two annulations at the base of each pedicel, and sometimes also in the course of the longer pedicels. The hydrophore is but slightly everted.

Gonosome.—The gonangium (only the female gonangia were observed) is unusual in appearance for a *Halecium* species. It is obovate, 0.5 mm. in length, almost sessile and distinctly corrugated. The opening is on the side about one third of the length of the pedicel from the distal end; it is on the terminus of a small hydrophore-like structure but no zooids were observed in the opening.

Distribution.—Isabel Island, 15-25 fathoms.

Halecium nanum Alder

Halecium nanum Alder, Ann. and Mag. Nat. Hist. (3), III, 1859, p. 355.
Fraser, Beaufort Hyd., 1912, p. 367.

Distribution.—South Viradores Islands, 8-10 fathoms.

Halecium regulare, new species

Plate 10, Fig. 47

Trophosome.—Colony minute, slender, 5 mm., growing from a stolon that forms a loose network; branches few or absent, similar to the main stem. Stem zigzag, two or three nodes between the first hydrophore and the base of the stem; in all other cases, there is a hydrophore to each internode. Hydrophore sessile, the margin even with the node, expanding to the margin but not definitely flaring.

Gonosome.—Not observed.

Distribution.—Jicaron Island, 15 fathoms; north of White Friars, 5-10 fathoms; east of islands off Navidad Head, 25-35 fathoms.

The colony bears some resemblance to *H. articulosum* Clark but is a much smaller species.

Halecium tenellum Hincks

Halecium tenellum Hincks, Ann. and Mag. Nat. Hist. (3), VIII, 1861, p. 252.
Fraser, Hyd. of Vancouver Island, 1914, p. 169.

Distribution.—North of Wenman Island, 100-150 fathoms; Black Beach, at low tide; Post Office Bay, 12-15 fathoms; James Bay, 50-70 fathoms; Cartago Bay, 32 fathoms; between Charles and Indefatigable islands, 60 fathoms; off Black Beach, 25-40 fathoms; Secas Islands, 25 fathoms; White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Halecium tortum, new species

Plate 10, Fig. 48

Trophosome.—(No complete colony obtained.) Main stem and larger branches strongly fascicled; smaller branches simple, slender, sometimes again branched. Each branch is more in the nature of hydrophore pedicels than a continuous series of internodes; each pedicel, except the proximal, arises from the preceding one at a point just below the hydrophore. The hydrophores are somewhat alternately arranged, but as they are not all in the same plane they may have a decided spiral twist; rim of hydrophore scarcely flaring.

Gonosome.—Not observed.

Distribution.—East of islands off Navidad Head, 25-35 fathoms.

Halecium vagans, new species

Plate 10, Fig. 49

Trophosome.—Slender, somewhat straggling colony, 13 mm. high, branching irregular, with a tendency to dichotomy. Internodes of stem long and slender, commonly with a double annulation at the node, the sessile hydrophore being just below the annulation. Branches give off immediately below the hydrophore, either singly or in pairs, to give the

dichotomous effect. When a hydrophore terminates a branch, the pedicel is of considerable length, otherwise it is sessile. Hydrophore scarcely flaring.

Gonosome.—Not observed.

Distribution.—South of La Plata Island, 45-55 fathoms; San Francisco Bay, 3-8 fathoms; Pacora Island, 15-25 fathoms; Secas Islands, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

This species bears some resemblance to *H. tenellum,* but the stem and branches are much less annulated or wrinkled, the cauline hydrophores are sessile and they lack the strong flare so evident in *H. tenellum.*

Halecium washingtoni Nutting

Halecium geniculatum NUTTING, Hyd. of Alaska and Puget Sound, 1899, p. 744.

Halecium washingtoni NUTTING, Am. Nat., XXXIV, 1901, p. 789. FRASER, Hyd. of Vancouver Island, 1914, p. 169.

Distribution.—In the channel between Narborough and Albemarle islands, 70 fathoms; Thurloe Point, 8-10 and 30 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Genus OPHIODISSA

Ophiodissa laxa, new species

Plate 10, Fig. 50

Trophosome.—Colonies clustered, 15 mm.; stem strongly geniculate or somewhat dichotomously arranged. Each portion of the stem that corresponds to an internode in the regular type is slender, much elongated, and much the same size throughout, with one or two annulations at the base given off a short distance below the hydrophore of the preceding portion. There may be another hydrophore or branch given off from the opposite side, to give the dichotomous effect. The hydrophore is definitely flaring.

Tentacular organs large, tubular, commonly one from each pedicel or internodal portion of the stem.

Gonosome.—Not observed.

Distribution.—Secas Islands, 15 and 25 fathoms.

Ophiodissa negligens, new species

Plate 11, Fig. 51

Trophosome.—Colony small, 4 mm. high; stem geniculate, with each part in succession arising from the distal portion of the previous part, just below the hydrophore that terminates the part, or sometimes, dichotomous, where two such portions are given off opposite to each other, or the one part may divide dichotomously. Pedicel gradually increasing in diameter and almost insensibly passing into the hydrophore, which is not flaring. There is very little indication of annulation anywhere.

Tentacular organs large, shaped like the hydrophores with their pedicels; commonly one from each pedicel or portion of the stem.

Gonosome.—Not observed.

Distribution.—Port Utria, 40 fathoms, in 15 fathoms, and on coral at low tide.

Family Hebellidae

Genus HEBELLA

Hebella calcarata (A. Agassiz)

Lafoea calcarata A. Agassiz, N. A. Acalephae, 1865, p. 122.
Hebella calcarata Fraser, Beaufort Hyd., 1912, p. 371.

Distribution.—Secas Islands, 25 fathoms; White Friars, 25 fathoms and 5-10 fathoms; Isabel Island, 10-25 fathoms.

Genus SCANDIA

Scandia corrugata, new species

Plate 11, Fig. 52

Trophosome.—Individual zooids growing from a delicate stolon, creeping over *Synthecium;* each pedicel very short but distinct, making an acute angle with the stolon. Hydrotheca nearly tubular, narrowing suddenly at the base and truncated distally, but the distal end may flare slightly; surface slightly but regularly corrugated; margin entire.

Gonosome.—Gonangium small, growing at regular intervals from the stolon; shorter than the hydrotheca; broadly oval, narrowing distally to form a distinct neck; surface corrugated.

Distribution.—White Friars Islands, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Scandia mutabilis (Ritchie)

Campanularia mutabilis RITCHIE, Hyd. from Cape de Verde Is., 1907, p. 504.

Scandia mutabilis FRASER, Beaufort Hyd., 1912, p. 372.

Distribution.—North of Wenman Island, low tide; Tagus Cove, 30 fathoms; Black Beach, low tide; San Francisco Bay, 2 fathoms; Santa Maria Bay, 10 fathoms.

Family Lafoeidae

Genus FILELLUM

Filellum serpens (Hassall)

Campanularia serpens HASSALL, Trans. Micr. Soc., 1852, p. 163.

Filellum serpens FRASER, Hyd. of Vancouver Island, 1914, p. 172.

Distribution.—Post Office Bay, 12-15 fathoms; James Bay, 20 fathoms, and 50-70 fathoms; Gardner Bay, 25-35 fathoms; Santa Elena Bay, 10-12 fathoms; Jicaron Island, 25-30 fathoms; Pacora Island, 15-25 fathoms; Secas Islands, 15 and 25 fathoms; Tangola-Tangola, 15-25 fathoms; White Friars Islands, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Thurloe Point, 30 fathoms.

Genus LAFOEA

Lafoea intermedia, new species

Plate 11, Fig. 53

Trophosome.—Stem and portions of the principal branches fascicled; branches not numerous, irregularly arranged, making an angle of nearly 90° with the stem. Hydrotheca tubular, tapering to the base, but little curved; pedicels with one or two slight twists, coming out from the stem at an angle that is usually nearly 90°, but may be considerably less, near the tip of the branch.

Gonosome.—Coppinia mass elongate, elliptical, with the separate gonangia but rarely hexagonal; they are much more often nearly circular in cross section, not regularly arranged. Each gonangium with a distinct collar, much less in diameter than the main portion of the gonangium. The hydrothecal tubes are not numerous but they vary much in size and length.

Distribution.—North of Wenman Island, 100-150 fathoms; James Bay, 50-70 fathoms; Cartago Bay, 32 fathoms; between Charles and Indefatigable islands, 60 fathoms; east of islands off Navidad Head, 25-35 fathoms.

This species appears to be intermediate between *L. gracillima* and *L. fruticosa.* The shape of the hydrotheca and its pedicel and the nature of the coppinia mass bear considerable resemblance to *L. gracillima,* while the mode of branching and the angle that the hydrotheca makes with the branch resemble *L. fruticosa.* The size of the hydrotheca in *L. gracillima* varies much but, in general, that of *L. intermedia* is intermediate between that of *L. gracillima* and *L. fruticosa.* The hydrothecal tubes of *L. intermedia* are quite characteristic, being quite different from those in either of the two species but particularly so when compared with those of *L. fruticosa.*

Genus LICTORELLA

Lictorella adhaerens, new species

Plate 11, Fig. 54

Trophosome.—Main stem strongly fascicled, rigid, 50 mm.; the individual tubes slender. Few hydrothecae and nematophores on the stem. Branches slender as compared with the stem but, like it, rigid; arranged in subopposite pairs, each making almost a right angle with the stem. Some of the branches are fascicled slightly toward the base, but most of them are simple throughout. Hydrothecae with regular alternate arrangement, each with a short pedicel not adhering to the branch, although the hydrotheca itself is adherent in its basal portion; hydrotheca regularly curved, so that the margin is parallel to the branch and some distance from it. Margin commonly reduplicated. A nematophore attached to each pedicel.

Gonosome.—Not observed.

Distribution.—Between Charles and Indefatigable islands, 120 fathoms.

Lictorella cervicornis Nutting

Lictorella cervicornis NUTTING, Hawaiian Hyd., 1905, p. 934.
FRASER, Monobrachium parasitum and other west coast hydroids, 1918, p. 134.

Distribution.—North of Wenman Island, 120-150 fathoms; between Charles and Indefatigable islands, 60 fathoms.

Family Synthecidae

Genus SYNTHECIUM

Synthecium gracile Fraser

Synthecium gracile FRASER, Johnson-Smithsonian Hyd., 1937, p. 2.

Distribution.—Santa Elena Bay, 10-12 fathoms; Port Utria, 20 fathoms; Pacora Island, 15-25 fathoms; White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Santa Maria Bay, 10 fathoms; South Bay, Cerros Island, low tide and in 10-15 fathoms.

Synthecium projectum, new species

Plate 11, Fig. 55

Trophosome.—Short, stout, unbranched colonies arise from a stolon, 10 mm. high. The stem is divided into rather long internodes by slightly oblique nodes. There is one hydrotheca to each internode, with a regularly alternate arrangement; two successive hydrothecae on the same side are quite distant. Hydrotheca projecting well out from the stem, adhering at the base and about one third of the adcauline side; stout, about half as wide as long, the free portion turning out at an angle of a little more than 45° with the stem. Margin somewhat saddle-shaped, flaring a little.

Gonosome.—Not observed.

Distribution.—Bahia Honda, 15-25 fathoms; White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Santa Maria Bay, low tide; Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, low tide.

Synthecium rigidum, new species

Plate 11, Fig. 56

Trophosome.—Colony unbranched, straight and rather rigid, 10 mm. high; divided into regular internodes, with one hydrotheca to each, alternating. Hydrotheca nearly as broad as deep, 0.28-0.32 mm., and much the same diameter throughout; adnate from one third to one half of its length. Margin circular, definitely flaring.

Gonosome.—Not observed.

Distribution.—Santa Elena Bay, 10 fathoms; White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Synthecium symmetricum, new species

Plate 12, Fig. 57

Trophosome.—Colony slender, 15 mm. high, with pairs of opposite branches given off almost at right angles to the main stem, with no hydrothecae in the axils; no hydrothecae below the proximal branches, and none for some distance above each pair of branches; the pairs between the branches and those on the proximal portion of the branch are more distant than the others. Hydrothecae opposite, each almost tubular, regularly curved so that the distal portion is almost at right angles to the proximal portion; approximately two thirds adherent; about 1.0 mm. in length. Margin entire but slightly and regularly curved.

Gonosome.—Gonangia growing out of either one or both of the pairs of hydrothecae at a node; elongated oval, tapering to a narrow neck distally; strongly corrugated.

Distribution.—Santa Elena Bay, 10 fathoms; San Francisco Bay, 2-8 fathoms; Port Utria, 20 and 40 fathoms; Jicaron Island, 15 fathoms; Pacora Island, 15-25 fathoms; Secas Islands, 25 fathoms; north of White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Family Sertularidae

Genus DIPHASIA

Diphasia paarmani Nutting

Diphasia paarmani NUTTING, Am. Hyd., Part II, 1904, p. 111.

Distribution.—Reef north of entrance to Tagus Cove, low tide.

Genus PASYA

Pasya quadridentata (Ellis and Solander)

Sertularia quadridentata E. and S., Nat. Hist. Zoophytes, 1786, p. 57.

Pasythea quadridentata NUTTING, Am. Hyd., Part II, 1904, p. 75.

Distribution.—Reef north of entrance to Tagus Cove, low tide; Santa Elena Bay, 5-7 and 10-12 fathoms; La Plata Island, low tide; Pacora Island, 15-25 fathoms; Santa Maria Bay, 10 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Genus SERTULARELLA

Sertularella ampullacea, new species

Plate 12, Fig. 58

Trophosome.—Colony slender, lax, 7 mm. high, with one or two branches or without branches. What may be considered as the stem consists of a series of long sections, each of which arises from the preceding section, just below its terminal hydrotheca, the proximal portion forming a distinct "knee" bend. When a branch is given off, it appears opposite the section given off in the usual way; annulations at the base of the section faint or absent. Hydrothecae elongated-ovate, the distal portion forming a "neck"; surface strongly and regularly corrugated; margin with four teeth; operculum of four flaps.

Gonosome.—Not observed.

Distribution.—Port Utria, 15-20 fathoms; Pacora Island, 15-25 fathoms.

Sertularella conica Allman

Sertularella conica ALLMAN, Hyd. of the Gulf Stream, 1877, p. 21.
NUTTING, Am. Hyd., Part II, 1904, p. 79.

Distribution.—South of Clarion Island, 50 fathoms; Tagus Cove, 30 fathoms; James Bay, 50-70 fathoms; Black Beach, 25-40 fathoms; White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Sertularella exilis, new species

Plate 12, Fig. 59

Trophosome.—Small, slender, unbranched colonies, 6-12 mm. high, grow from a reticulate stolon. Nodes, indicated but not definite, divide the stem into internodes, each bearing one hydrotheca; hydrothecae alternate, distant. Hydrotheca regularly curved upward and then outward; smooth, much the same diameter throughout. Margin with four, not very distinct, teeth; operculum of four flaps.

Gonosome.—Not observed.

Distribution.—Bahia Honda, 15-25 fathoms; White Friars, 25 fathoms.

Sertularella formosa Fewkes

Sertularella formosa Fewkes, Bull. Mus. Comp. Zool., Harvard, VIII, No. 7, 1881, p. 130.

Nutting, Amer. Hyd., Part II, 1904, p. 104.

Distribution.—Santa Elena Bay, 10-12 fathoms; San Francisco Bay, 2 fathoms; Gorgona Island, low tide and in 20 fathoms; Pacora Island, 15-25 fathoms; Secas Islands, 25 fathoms; White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Sertularella fusiformis (Hincks)

Sertularia fusiformis Hincks, Ann. and Mag. Nat. Hist. (3), VIII, 1861, p. 253.

Sertularella fusiformis Nutting, Am. Hyd., Part II, 1904, p. 89.

Distribution.—North of Wenman Island, low tide; off Albemarle Point, low tide.

Sertularella incisa, new species

Plate 12, Fig. 60

Trophosome.—Most of the colonies unbranched, less than 2 mm. high, erect, rigid, but not very stout; not very definitely divided into internodes. Hydrothecae regularly alternate, distant; curved regularly outward; about one half of the adcauline side adherent, with thick chitin at the base. Margin with three teeth, two of them more distinct than the third; operculum of three flaps.

When the colony is branched, the short branches may be quite close to each other, on each side. The angle that the branch makes with the stem seems to be continued as a curved incision into the stem, which is characteristic. There is no hydrotheca in the axil.

Gonosome.—Not observed.

Distribution.—South Bay, Cerros Island, 10-15 fathoms.

Sertularella rugosa (Linn.)

Sertularia rugosa Linnaeus, Syst. Nat., 1758, p. 809.

Sertularella rugosa Hincks, Br. Hyd. Zoophytes, 1868, p. 259.

Distribution.—Braithwaite Bay, on coral at low tide; Banks Bay, low tide; reef north of entrance to Tagus Cove, low tide; South Seymour Island, low tide; Santa Maria Bay, low tide; Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, low tide.

Sertularella tenella (Alder)

Sertularia tenella Alder, Cat. Zooph. Northumberland, 1857, p. 23.
Sertularella tenella Hincks, Br. Hyd. Zoophytes, 1868, p. 242.

Distribution.—North of Wenman Island, 100-150 fathoms; Tagus Cove, 30 fathoms; Cartago Bay, 32 fathoms; between Charles and Indefatigable islands, 60 fathoms; Santa Elena Bay, 10-12 fathoms; La Plata Island, 45-55 fathoms; Secas Islands, 25 fathoms.

Sertularella turgida (Trask)

Sertularia turgida Trask, Proc. Cal. Acad. Sc., 1857, p. 113.
Sertularella turgida Nutting, Am. Hyd., Part II, 1904, p. 95.

Distribution.—Santa Maria Bay, low tide; Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, low tide and in 10-15 fathoms.

Genus SERTULARIA

Sertularia anceps, new species

Plate 13, Fig. 61

Trophosome.—Colony slender, up to 40 mm., with opposite branches similar to the main stem; sometimes only one of the pairs of branches is developed; stem divided regularly into internodes. Branches given off almost at right angles, a distinct constriction at the base of each. Hydrothecae placed so that the pair is separated almost equally at each margin; no front and back distinction; they are near together for about one third of their length and then turn outward rather abruptly, so that the distal portion of the hydrotheca is nearly at right angles to the stem. Margin with three teeth, operculum with three flaps.

Gonosome.—Not observed.

Distribution.—Santa Elena Bay, 10 fathoms and on drifting *Sargassum;* Secas Islands, 15 and 25 fathoms; Isabel Island, 10-25 fathoms; off Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Sertularia cornicina (McCrady)

Dynamena cornicina McCrady, Gymno. Charleston Har., 1859, p. 204.

Sertularia cornicina Nutting, Am. Hyd., Part II, 1904, p. 58.

Distribution.—North of White Friars, 5-10 fathoms.

Sertularia desmoides Torrey

Sertularia desmoides Torrey, Hyd. Pac. Coast, 1902, p. 65.
Nutting, Am. Hyd., Part II, 1904, p. 56.

Distribution.—Between Charles and Indefatigable islands, 60 fathoms; off Black Beach, 25-40 fathoms; Tangola-Tangola, low tide; Santa Maria Bay, 10 fathoms.

Sertularia dispar, new species

Plate 13, Fig. 62

Trophosome.—Colony unbranched, 10 mm. high; stem divided into rather short internodes, on each of which a pair of hydrothecae is nearly medially placed, the pair in contact for a short distance at the base, on the face of the stem, but distinctly separated throughout, on the back of the stem. Hydrothecae stout for their length, tapering distally to a margin with two teeth, placed in such a position that the one flap of the operculum is much larger than the other.

Gonosome.—Gonangium arising from the face of the stem, in its proximal portion, from the central part of the internode, nearly at right angles to the stem; 1.2 mm. long, 0.8 mm. in diameter; pedicel short and stout. Gonangium strongly corrugated, distally truncated, with a full sized opening.

Distribution.—Santa Elena Bay, 10 fathoms; San Francisco Bay, 2 fathoms; Santa Maria Bay, 10 fathoms; South Bay, Cerros Island, low tide.

Sertularia exigua Allman

Sertularia exigua Allman, Hyd. Gulf Stream, 1877, p. 24.
Fraser, Jap. Hyd., II, 1936, p. 50.

Distribution.—Port Culebra, low tide; Tangola-Tangola, low tide; Santa Maria Bay, 10 fathoms; off Thurloe Point, 8-10 fathoms.

Sertularia furcata Trask

Sertularia furcata TRASK, Proc. Cal. Acad. Sc., 1857, p. 112.
FRASER, West Coast Hyd., 1911, p. 72.

Distribution.—Off Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, low tide and in 10-15 fathoms.

Sertularia mayeri Nutting

Sertularia mayeri NUTTING, Am. Hyd., Part II, 1904, p. 58.

Distribution.—Santa Elena Bay, 5-6 fathoms and 10-12 fathoms; north of White Friars, 5-10 fathoms.

Sertularia stookeyi Nutting

Sertularia stookeyi NUTTING, Am. Hyd., Part II, 1904, p. 59.
FRASER, Beaufort Hyd., 1912, p. 375.

Distribution.—North shore of Wenman Island, low tide; off Albemarle Point, on floating *Sargassum;* Santa Elena Bay, 5-7 fathoms; San Francisco Bay, 2 fathoms; Pacora Island, 15-25 fathoms; Tangola-Tangola, on coral at low tide; off White Friars, 25 fathoms.

Sertularia versluysi Nutting

Sertularia versluysi NUTTING, Am. Hyd., Part II, 1904, p. 53.
FRASER, Beaufort Hyd., 1912, p. 375.

Distribution.—Tagus Cove, low tide; reef north of entrance to Tagus Cove, low tide.

Genus THUIARIA

Thuiaria simplex, new species

Plate 13, Fig. 63

Trophosome.—Colony unbranched, slender, 12 mm. high. Stem divided into regular internodes by slightly oblique nodes. Hydrothecae regularly alternating, one to each internode; gradually curved from base to margin; of much the same diameter throughout; margin with two blunt teeth; operculum of two flaps. The distal portion on the

proximal or upper side seems to collapse readily so that many of the hydrothecae have an appearance similar to that of a *Diphasia* hydrotheca.

Gonosome.—Not observed.

Distribution.—Santa Elena Bay, 10 fathoms; San Francisco Bay, 2 fathoms; Gorgona Island, 5-6 fathoms; east of islands off Navidad Head, 25-35 fathoms; South Bay, Cerros Island, low tide.

Thuiaria tubuliformis (Markt.)

Dynamena tubuliformis Marktanner-Turneretscher, Hyd. des K. K. Natur. Hofmuseums, 1890, p. 238.

Thuiaria tubuliformis Nutting, Am. Hyd., Part II, 1904, p. 70.

Distribution.—North shore of Wenman Island, low tide; Albemarle Point, low tide; Banks Bay, low tide; Narborough Lagoon, low tide; reef north of entrance to Tagus Cove, low tide; South Seymour Island, low tide; Sulivan Bay, low tide; Cartago Bay, low tide; Santa Elena Bay, 10-12 fathoms; Gorgona Island, low tide; Port Utria, low tide; Jicarita Island, low tide; Bahia Honda, low tide; Tangola-Tangola, low tide.

Family Plumularidae

Genus AGLAOPHENIA

Aglaophenia diegensis Torrey

Aglaophenia diegensis Torrey, Hyd. of the Pac. Coast, 1902, p. 71. Fraser, West Coast Hyd., 1911, p. 71.

Distribution.—North shore of Wenman Island, low tide; Tagus Cove, 30 fathoms; reef north of entrance to Tagus Cove, low tide; Santa Maria Bay, low tide; South Bay, Cerros Island, 10-15 fathoms.

Aglaophenia inconspicua Torrey

Aglaophenia inconspicua Torrey, Hyd. of Pac. Coast, 1902, p. 71.

Distribution.—Near Christopher Point, Albemarle Island, low tide; Black Beach, low tide; Santa Maria Bay, 35-40 fathoms.

Aglaophenia praecisa, new species

Plate 13, Fig. 64

Trophosome.—Colony small, 12 mm. high, divided into regular internodes, each of which bears a hydrocladium. Hydrocladia nearly in the same plane, given off almost at right angles to the stem. Hydrothecae closely approximated; Margin with 9 teeth, the median sharp, retrorse, but not very markedly so; the first, second, and third pairs, rounded and nearly equal; the fourth pair more slender and sharper. The widest angle lies between the first and second teeth on each side, and the most acute between the median tooth and the first pair. Intrathecal ridges present but not strongly marked; lateral nematophores reaching above the margin of the hydrotheca; median nematophore short, not reaching nearly to the margin of the hydrotheca; the three nematophores on each cauline internode similarly tubular.

Gonosome.—Not observed.

Distribution.—Santa Maria Bay, 10 fathoms.

Aglaophenia rigida Allman

Aglaophenia rigida ALLMAN, Hyd. Gulf Stream, 1877, p. 43.
FRASER, Beaufort Hyd., 1912, p. 378.

Distribution.—Off White Friars, 25 fathoms; Isabel Island, 10-25 fathoms; Santa Maria Bay, 10 fathoms and 35-40 fathoms.

Genus ANTENNELLA

Antennella avalonia Torrey

Antennella avalonia TORREY, Hyd. Pac. Coast, 1902, p. 74.

Distribution.—East of islands off Navidad Head, 25-35 fathoms.

Antennella compacta, new species

Plate 13, Fig. 65

Trophosome.—Colony small, 6 or 7 mm.; one or two proximal internodes, long and without hydrothecae, have a varying number of nematophores; the remainder of the hydrocladium is divided into alternating hydrothecate and nonhydrothecate internodes; the hydrothecate internode, with a transverse node proximally and an oblique node dis-

tally, has the usual type of hydrotheca for this genus, with a mesial nematophore just proximal to it (like that of *A. gracilis),* and a pair, one on each side, much larger, with a trumpet-shaped distal section (like those of *A. secundaria);* the nonhydrothecate internode is short and has but one nematophore.

Gonosome.—Gonangium, arising from the hydrothecate internode, just proximal to the mesial nematophore, obovate and curved, tapering at the base to a short pedicel; two nematophores where the gonangium joins the pedicel.

Distribution.—South Bay, Cerros Island, 10-15 fathoms.

Antennella gracilis Allman

Antennella gracilis ALLMAN, Hyd. Gulf Stream, 1877, p. 38.

Distribution.—South of Clarion Island, 32 fathoms; Secas Islands, 25 fathoms; Tangola-Tangola, 15-20 fathoms; off White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Isabel Island, 10-25 fathoms.

Genus ANTENNULARIA

Antennularia alternata, new species

Plate 13, Fig. 66

Trophosome.—Main stem, 70 mm. long, simple, straight, canaliculated. Hydrocladia given off in two series, one on each side of the stem, in the same plane or almost so; those in the two series regularly alternating with each other. Each hydrocladium arises from a process of the stem, at least half as long as the first internode; each hydrocladial internode bears one cup-shaped hydrotheca near the middle, adhering to the hydrocladium throughout its whole length. The nodes may be transverse or somewhat oblique; no definite septal ridges. Two-chambered nematophores appear on the main stem, usually two between two succeeding hydrocladia on the same side. There is a low, immovable, one-chambered nematophore on a papilla at the base of the hydrocladial process and one movable, two-chambered nematophore farther out on the process; on each internode of the hydrocladium there is a nematophore below the hydrotheca and one, some distance above; two immediately above.

Gonosome.—Gonangia appearing in pairs on the more distal hydrocladial processes; concavo-convex, with the concave side toward the stem; shaped like a bent pear.

Distribution.—North of Wenman Island, 100-150 fathoms.

This species is a typical Antennularian except for the hydrocladial arrangement, which is as definitely Plumularian. In this it agrees with *Nemertesia disticha* (Heller).

Antennularia irregularis, new species

Plate 13, Fig. 67

Trophosome.—Colony plumose, 5 cm. high; nodes not regularly placed or well marked. Slender hydrocladia irregularly arranged, on several sides of the stem, proximally, but with a tendency to an opposite arrangement, distally; sometimes regularly alternate, at other times, subopposite. It is difficult to describe the hydrocladia, as no two are quite alike. In some cases the proximal internode is hydrothecate, in others there may be one, two, or even three nonhydrothecate internodes before the first hydrothecate internode; there may be one, two, or three intermediate internodes; all or nearly all of them have a distinct ridge near each end. Each internode bears a mesial nematophore, some of the intermediate internodes, two; there are two supracalycine nematophores. A cauline nematophore is present on the shoulder that bears the hydrocladium and, in some cases, one is present on the medial portion of the internode.

Gonosome.—Not observed.

Distribution.—South of La Plata Island, 45-55 fathoms.

Antennularia tetraseriata, new species

Plate 14, Fig. 68

Trophosome.—Stem stout (fragment 2 cm. long), simple, canaliculated with large canals. Hydrocladia in four series, in two opposite pairs, i.e., decussate; each hydrocladium arises from a process of the stem about half of the length of the hydrocladial internode. Each internode bears one shallow hydrotheca, slightly proximal to the middle of the internode; a distinct septal ridge near each end of each internode. Cauline nematophores in line with the hydrocladial processes, two between each two successive hydrocladia, one large nematophore in the

axil of the process; on the process, there is one low one-chambered nematophore and one two-chambered, on the proximal hydrocladial internode; one below the hydrotheca and a pair immediately above it; other internodes usually have two proximal nematophores.

Gonosome.—Not observed.

Distribution.—South of Clarion Island, 55 fathoms.

Genus CLADOCARPUS

Cladocarpus tortus, new species

Plate 14, Fig. 69

Trophosome.—Stem simple, unbranched, 30 mm. high. A twist in the stem just proximal to the first hydrocladium shows three distinct nodes; otherwise there are no nodes indicated on the stem. Hydrocladia regularly alternate, but not quite in the same plane, the longest 6 mm., each arising from a distinct process of the stem; divided into regular internodes, each of which is almost entirely occupied by a hydrotheca. Hydrotheca much deeper than wide, the margin with a median, small, sharp tooth, lateral to which there are four shallow, rounded teeth, the last one sometimes indented. The supracalycine nematophores do not reach beyond the margin of the hydrotheca; the mesial nematophore projects outward, partly adherent to the hydrotheca, jointed near the base. A septal ridge is present at the base of the supracalycine nematophore, one at the base of the hydrotheca and three between them, but all of them are faint and short. There are two broad nematophores in the axil of the hydrocladial process, one on its face and one a short distance below this in the main stem. On the portion of the stem proximal to the first hydrocladium, there is a row of nematophores, rather close together distally, but more and more distant toward the base.

Gonosome.—Not observed.

Distribution.—South of La Plata Island, 45-55 fathoms.

Genus DIPLOCHEILUS

Diplocheilus allmani Torrey

Diplocheilus allmani Torrey, Hyd. of San Diego, 1904, p. 36.
Fraser, West Coast Hyd., 1911, p. 81.

Distribution.—Santa Maria Bay, low tide; off Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Genus LYTOCARPUS

Lytocarpus philippinus (Kirchenpauer)

Aglaophenia philippina KIRCHEPAUER, Ueber die Hyd. Fam. Plumularidae, Part I, 1872, p. 45.

Lytocarpus philippinus NUTTING, Am. Hyd., Part I, 1900, p. 122.

Distribution.—Santa Elena Bay, 5-7 fathoms and 10-12 fathoms; La Plata Island, 10-12 fathoms; San Francisco Bay, 2 fathoms; Gorgona Island, on coral at low tide; Port Utria, on coral at low tide; Bahia Honda, 15-25 fathoms; Secas Islands, 15 and 25 fathoms; South Viradores Islands, 8-10 fathoms; off White Friars, 25 fathoms; off Morro de Petatlan, 25 fathoms; off Tenacatita Point, 10 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Genus MONOSTAECHAS

Monostaechas quadridens (McCrady)

Plumularia quadridens McCRADY, Proc. Elliott Soc., 1859, p. 199.

Monostaechas quadridens NUTTING, Am. Hyd., Part I, 1900, p. 75.

Distribution.—Braithwaite Bay, 16-18 fathoms; south of Clarion Island, 50 fathoms; Black Beach, low tide; San Francisco Bay, 2 and 3-8 fathoms; Port Utria, 15-20 fathoms; Pacora Island, 15-25 fathoms; Secas Islands, 15 fathoms; Tangola-Tangola, 15-20 fathoms; east of islands off Navidad Head, 25-35 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Genus PLUMULARIA

Plumularia acutifrons, new species

Plate 14, Fig. 70

Trophosome.—Colony small and slender, up to 2 cm. in height, but mostly shorter than this. Stem divided into regular short internodes, each somewhat rounded at each end, giving a constricted appearance to the stem at each node. Each internode bears a hydrocladium near its distal end; the hydrocladia alternate. The hydrocladial process grows rather from the face of the internode than from the lateral surface, the successive hydrocladia being little more than 30° from each other. Each hydrocladium is divided into alternate nonhydrothecate and hydrothecate internodes, the proximal being nonhydrothecate. The nonhydrothecate

are short with a well marked septal ridge; the hydrothecate are relatively long, nearly equal in depth and breadth with the hydrotheca near the distal end; there is a strong septal ridge near each end. There are two supracalycine nematophores and one mesial one on each hydrothecate internode, none on the nonhydrothecate. There is one cauline nematophore on each internode, just distal to the hydrocladial process.

Gonosome.—Not observed.

Distribution.—Off Thurloe Point, 8-10 fathoms.

Plumularia alicia Torrey

Plumularia alicia Torrey, Hyd. Pac. Coast, 1902, p. 75.
Torrey, Hyd. San Diego, 1904, p. 37.

Distribution.—South Bay, Cerros Island, low tide.

Plumularia alternata Nutting

Plate 14, Fig. 71

Plumularia alternata Nutting, Am. Hyd., Part I, 1900, p. 62.
Fraser, Beaufort Hyd., 1912, p. 381.

Trophosome.—Colony simple, unbranched, 12 mm. Stem geniculate, divided into internodes of which every alternate one bears a hydrotheca and a hydrocladium. Hydrocladia divided into regular internodes, hydrothecate and nonhydrothecate alternating, the proximal one being nonhydrothecate; hydrothecate internodes bounded by oblique nodes proximally and transverse nodes distally. Hydrotheca deeply campanulate, with about one third of the distal portion free. Supracalycine nematophores present, and mesial nematophores on both types of internodes. There is one nematophore on each internode of the stem and one at the axil of the hydrocladium.

Gonosome.—(Not previously described.) Gonangia arise in verticils of four just below the bases of the cauline hydrothecae, each gonangium with a short pedicel, with two or three annulations. The gonangium is the shape of a curved cornucopia, enlarging gradually to the distal end, which is almost truncate. Each gonangium bears two nematophores. The blastostyle follows the curve of the gonangium and had a definite enlargement near its distal end.

Distribution.—Braithwaite Bay, on coral at low tide; north of Wenman Island, 100-150 fathoms; and at low tide; Black Beach, low

tide; Santa Elena Bay, 8-12 fathoms; Port Utria, on coral at low tide; Jicarita Island, low tide; Pacora Island, 15-25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Isabel Island, 15-25 fathoms.

Plumularia biarmata, new species

Plate 14, Fig. 72

Trophosome.—Colony with slender stem, 10 mm. high, and long, slender hydrocladia. The stem is divided into regular internodes by distinct nodes; each internode gives off a hydrocladial process near its distal end; the hydrocladia alternating from side to side in the same plane. Hydrocladia bearing as many as 8 hydrothecae; the first internode is short with a transverse node proximally and an oblique one distally; it does not bear a hydrotheca. All the other internodes are hydrothecate. The internode is long and slender and the hydrotheca is situated not far from the distal end. Each internode is rounded at each end, so that the hydrocladium is very slender at the nodes. The hydrotheca is but slightly deeper than wide. On each hydrothecate internode but the first there are two mesial nematophores, one not far from the base and the other near the base of the hydrotheca; the first one has but one; there are two supracalycine nematophores. There is no nematophore on the proximal internode; there is one at the axil of the hydrocladial process and another cauline one, a short distance above it on the next internode.

Gonosome.—Not observed.

Distribution.—Bahia Honda, 15-25 fathoms; Secas Islands, 15 fathoms; east of islands off Navidad Head, 25-35 fathoms.

Plumularia corrugata Nutting

Plumularia corrugata NUTTING, Am. Hyd., Part I, 1900, p. 64.
FRASER, Hyd. of Vancouver Island, 1914, p. 205.

Distribution.—South Bay, Cerros Island, 10-15 fathoms.

Plumularia defecta, new species

Plate 15, Fig. 73

Trophosome.—Colony small, 8 mm., simple, unbranched; stem divided into regular internodes by single transverse nodes. Hydrocladia alternate, one to each internode, given off near the distal end; each

hydrocladium with alternating nonhydrothecate and hydrothecate internodes, the proximal being nonhydrothecate; nodes alternately transverse and slightly oblique. Hydrotheca nearly equal in depth and breadth. Two supracalycine nematophores and a mesial on the hydrothecate internode, none on the nonhydrothecate internodes; two nematophores at the axil of the hydrocladium and one on the cauline internode on the side opposite the hydrocladium.

The characteristic feature of the species is the lack of nematophores on the nonhydrothecate internodes.

Gonosome.—Not observed.

Distribution.—Off La Plata Island, 45-55 fathoms.

Plumularia delicata Nutting

Plumularia delicata NUTTING, Hawaiian Hyd., 1905, p. 951.

Distribution.—North of Wenman Island, 100-150 fathoms.

Plumularia filicula Allman

Plumularia filicula ALLMAN, Hyd. Gulf Stream, 1877, p. 29.
NUTTING, Am. Hyd., Part I, 1900, p. 58.

Distribution.—Off La Plata Island, 45-55 fathoms.

Plumularia floridana Nutting

Plumularia floridana NUTTING, Am. Hyd., Part I, 1900, p. 59.

Distribution.—Albemarle Point, low tide; Santa Elena Bay, on drifting *Sargassum* and in 10-12 fathoms; Pacora Island, 15-25 fathoms; Tangola-Tangola, on coral at low tide.

Plumularia inermis Nutting

Plate 15, Fig. 74

Plumularia inermis NUTTING, Am. Hyd., Part I, 1900, p. 62.
FRASER, Beaufort Hyd., 1912, p. 382.

Trophosome.—Colony simple, unbranched, 12 mm., divided into long, slender internodes, each of which bears a hydrocladium from a process near the distal end. The hydrocladia are divided into regular internodes, all of which, including the proximal, bear hydrothecae, ex-

cept very occasionally, when there may be an intermediate internode. These internodes are long and slender so that there is a long interval between the successive hydrothecae. Hydrotheca shallow campanulate; supracalycine nematophores absent. There is a nematophore above and one below the hydrotheca and one at the axil of each hydrocladium. Hydranths too large to be entirely retracted into the hydrotheca.

Gonosome.—(Not previously described.) Gonangium arising from the hydrocladial process of the stem; elongated obovate, with a very short pedicel; nearly twice as long as the hydrocladial internode.

Distribution.—Black Beach, low tide; Post Office Bay, 35-40 fathoms.

Plumularia lagenifera Allman

Plumularia lagenifera ALLMAN, Proc. Linn. Soc. London, 1885, p. 157.
NUTTING, Am. Hyd., Part I, 1900, p. 65.
FRASER, Hyd. of Vancouver Island, 1914, p. 207.

Distribution.—James Bay, 50-70 fathoms; Cartago Bay, 32 fathoms; east of islands off Navidad Head, 25-35 fathoms; Santa Maria Bay, 10 fathoms; off Thurloe Point, 8-10 fathoms; South Bay, Cerros Island, 10-15 fathoms.

Plumularia magellanica Hartlaub

Plate 15, Fig. 75

Plumularia magellanica HARTLAUB, Magellan Hyd., 1905, p. 684.

Trophosome.—Colony rather diminutive, 4 mm. high; main stem erect or slightly geniculate, definitely divided into internodes. From near the distal end of each internode a hydrocladium, if it can be called such, is given off, these regularly alternating and in the same plane. The hydrocladium may consist of a support for a single hydrotheca, or for two or more in a series, the support in each case having one or more nodes present. In each instance where there is more than one hydrotheca in the series, the extra hydrothecae are supported by pedicel-like structures arising from the preceding one, just below the hydrotheca. In each the pedicel or support becomes gradually broader from the proximal to the distal end, where it meets the hydrotheca. There are no nematophores anywhere in the colony.

Gonosome.—(Not previously described.) Gonangium arising from the hydrocladial process of the stem, or directly from the internode;

smooth, elongate, obovate, nearly twice as long as the hydrocladial internode.

Distribution.—Black Beach, at low tide and in 25-40 fathoms.

This species is so far from being a typical plumularian that it is a question if it should not be placed in a new genus.

Plumularia margaretta (Nutting)

Monotheca margaretta Nutting, Am. Hyd., Part I, 1900, p. 72.
Plumularia margaretta Leloup, West Indian Hyd., 1935, p. 54.

Distribution.—La Plata Island, 10-12 fathoms.

Plumularia propinqua, new species

Plate 15, Fig. 76

Trophosome.—Colony slender, 5 cm.; stem simple, divided into regular internodes by well-marked nodes, each bearing a single hydrocladium on a prominent process near the distal end, the hydrocladia alternating from side to side but in the same plane. The first hydrocladial internode is short and does not bear a hydrotheca, but all the other internodes, as many as five, are hydrothecate, each bearing one hydrotheca. The node between the first internode and the first hydrothecate internode is oblique, all the rest are transverse. Hydrotheca nearly equal in depth and breadth, or the depth is slightly greater; septal ridges absent; two supracalycine nematophores and one mesial nematophore on each hydrocladial internode that bears a hydrotheca, one in the axil of the hydrocladium and one medially placed on the cauline internode, on the side opposite the hydrocladial process.

Gonosome.—Gonangia small, not much larger than the hydrothecae; oval, arising from the axils of the hydrocladia, by a short pedicel.

Distribution.—Santa Elena Bay, 10-12 fathoms; Gorgona Island, 20 fathoms; Jicaron Island, 25-30 fathoms; Secas Islands, 25 fathoms; Tangola-Tangola, 15-20 fathoms; off White Friars, 25 fathoms; east of islands off Navidad Head, 25-35 fathoms; Isabel Island, 10-25 fathoms.

Plumularia setacea (Ellis)

Corallina setacea Ellis, Nat. Hist. Corallines, 1755, p. 19.
Plumularia setacea Hincks, Br. Hyd. Zoophytes, 1868, p. 296.

Distribution.—South of Clarion Island, 50 fathoms; north of Wenman Island, low tide; Albemarle Point, low tide; Black Beach, low tide; between Charles and Indefatigable islands, 60 fathoms.

Plumularia sinuosa, new species

Plate 15, Fig. 77

Trophosome.—Colony small, slender, 10-12 mm.; stem sinuous. The distal end of each internode is furcate, one portion continues as the next cauline internode and the other as a hydrocladium; these alternate from side to side. The hydrocladium consists of alternating nonhydrothecate and hydrothecate internodes, the proximal, a short one, being without a hydrotheca. The nonhydrothecate internode has a transverse node proximally and an oblique node distally, the hydrothecate internode, the reverse. The hydrotheca is deeply cup-shaped, centrally placed, with its margin free from the surface of the internode. On each cauline internode there is a nematophore at the angle of bifurcation, and one almost centrally placed on the side away from the hydrocladium; there is no nematophore on the proximal hydrocladial internode, but there is one on each of the other nonhydrothecate internodes; on each hydrothecate internode there is a nematophore proximal to the hydrotheca and two nematophores overtopping the hydrotheca.

Gonosome.—Not observed.

Distribution.—Braithwaite Bay, 30 fathoms; Academy Bay, 17-22 fathoms.

Genus SCHIZOTRICHA

Schizotricha tenella (Verrill)

Plumularia tenella VERRILL, Invert. Vineyard Sound, 1874, p. 731.
Schizotricha tenella NUTTING, Am. Hyd., Part I, 1900, p. 80.

Distribution.—Jicaron Island, 25-30 fathoms; Isabel Island, 10-25 fathoms.

Genus STREPTOCAULUS

Streptocaulus pulcherrimus Allman

Streptocaulus pulcherrimus ALLMAN, Challenger Hyd., I, 1883, p. 48.
NUTTING, Am. Hyd., Part I, 1900, p. 129.

Distribution.—Between Charles and Indefatigable islands, 60 fathoms; off Post Office Bay, 70-80 fathoms; Gardner Bay, 25-35 fathoms.

Some fine specimens of this species, hitherto recorded only from the Cape de Verde Islands, are well provided with gonangia. The largest colony, taken in Gardner Bay, has a length of 56 cm.

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PLATE 1

Fig. 1. *Clava parva*
a. Nutritive zooid.
b. Generative zooid.

Fig. 2. *Corydendrium flabellatum*
a. Portion of fascicled stem.
b. Hydranth extended.

Fig. 3. *Tubiclava laxa*
Colony showing nutritive and generative zooids.

Fig. 4. *Tubiclava triserialis*
A single zooid.

Fig. 5. *Balea irregularis*
Portion of fascicled stem and zooids.

Fig. 6. *Coryne repens*
a. Two zooids.
b. Zooid with sporosacs.

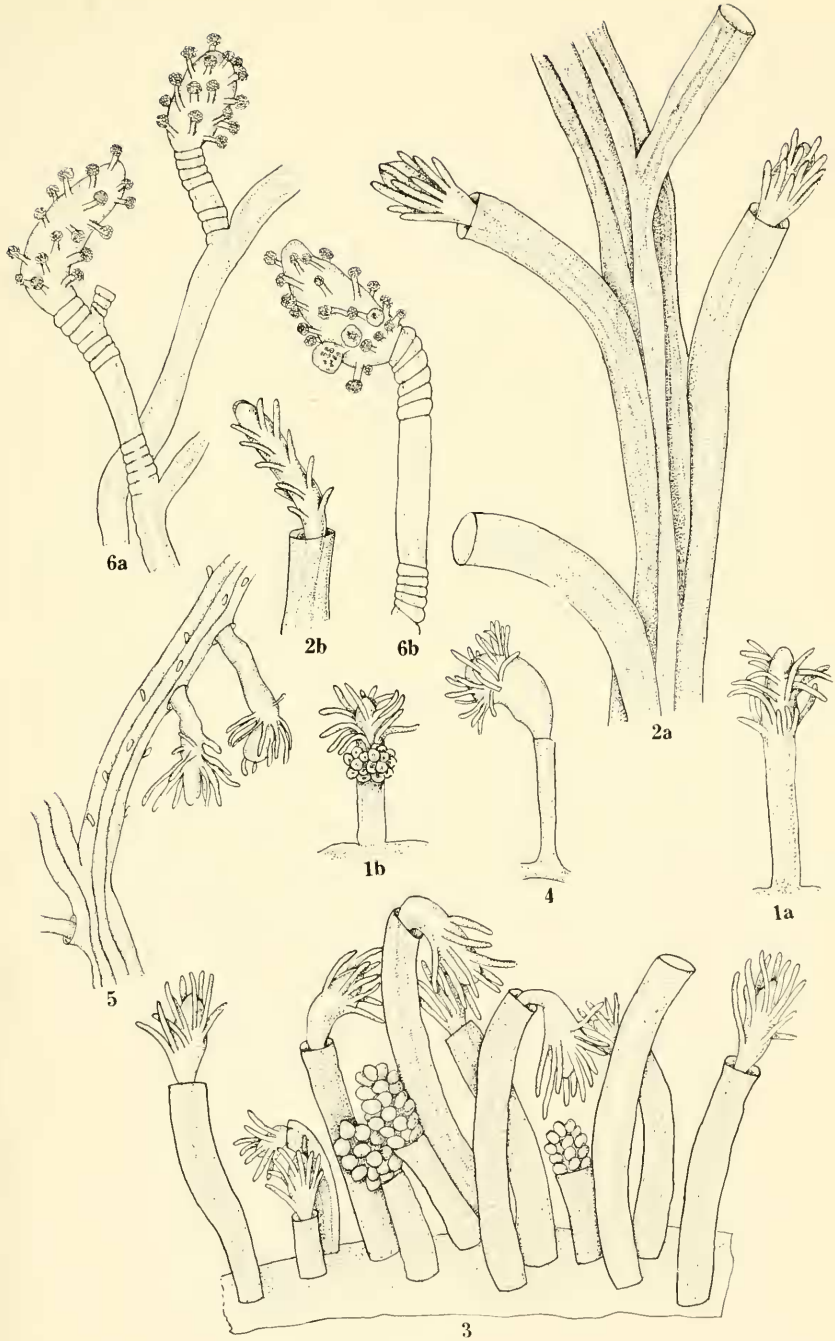
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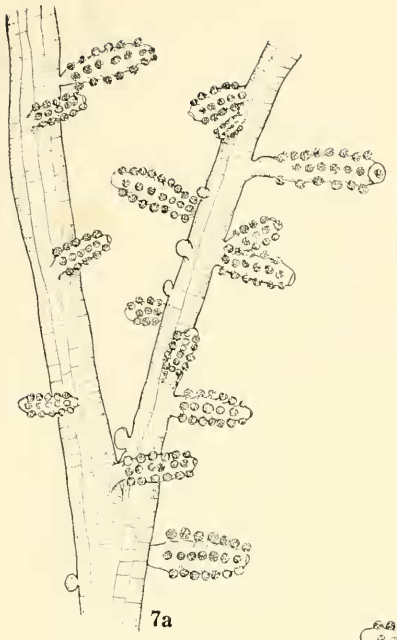
PLATE 2

Fig. 7. *Eugemmaria dendritica*
a. Portion of colony showing branch and zooids.
b. Portion of colony showing zooids and sporosacs.

Fig. 8. *Syncoryne flexibilis*
a. A single zooid.
b. Zooid with medusa buds.

Fig. 9. *Bimeria laxa*
Portion of colony.

Fig. 10. *Bimeria pygmaea*
Portion of colony.



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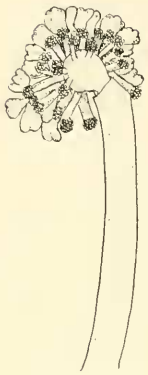

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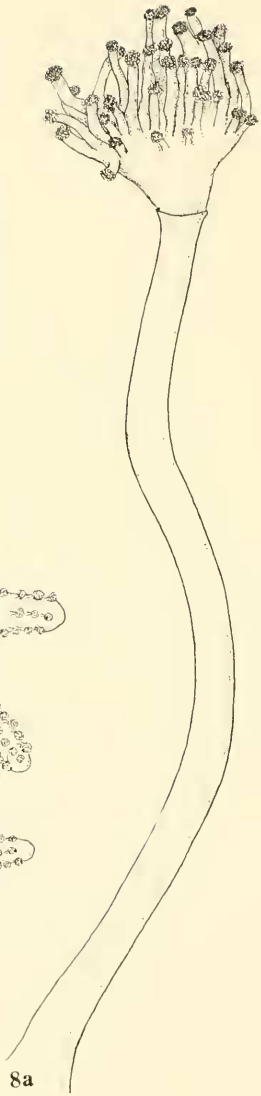

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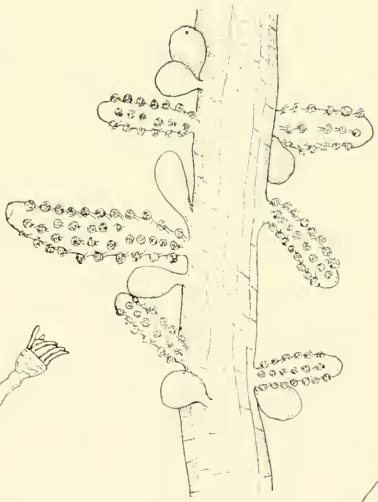

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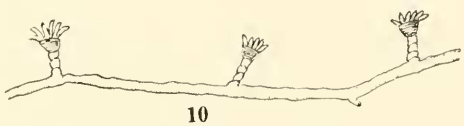

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PLATE 3

Fig. 11. *Bougainvillia crassa*
Portion of colony showing fascicled stem, branches, hydranths, and medusa buds.

Fig. 12. *Perigonimus robustus*
Portion of colony.

Fig. 13. *Eudendrium breve*
Two zooids.

Fig. 14. *Eudendrium certicaule*
a. Portion of female colony with sporosacs.
b. Portion of male colony with sporosacs.

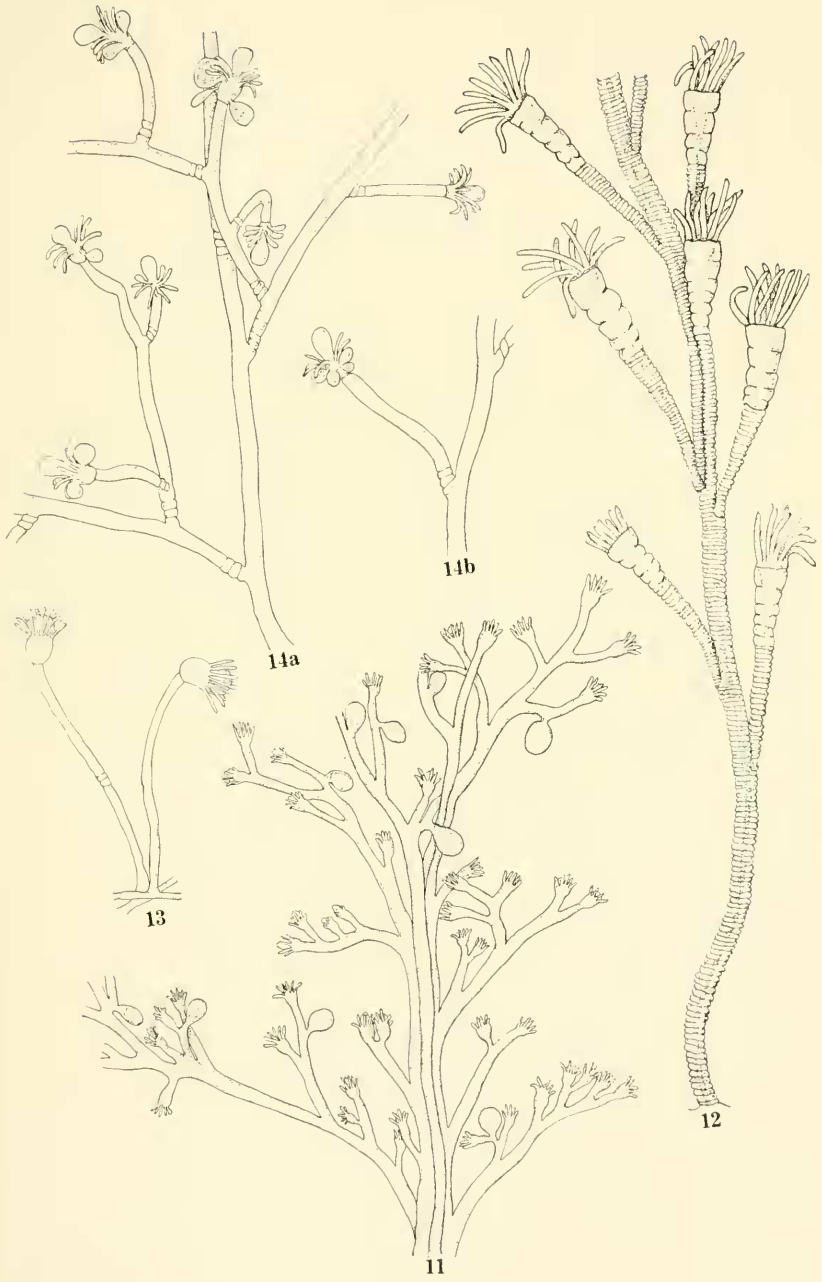
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PLATE 4

Fig. 15. *Eudendrium nodosum*
Portion of colony.

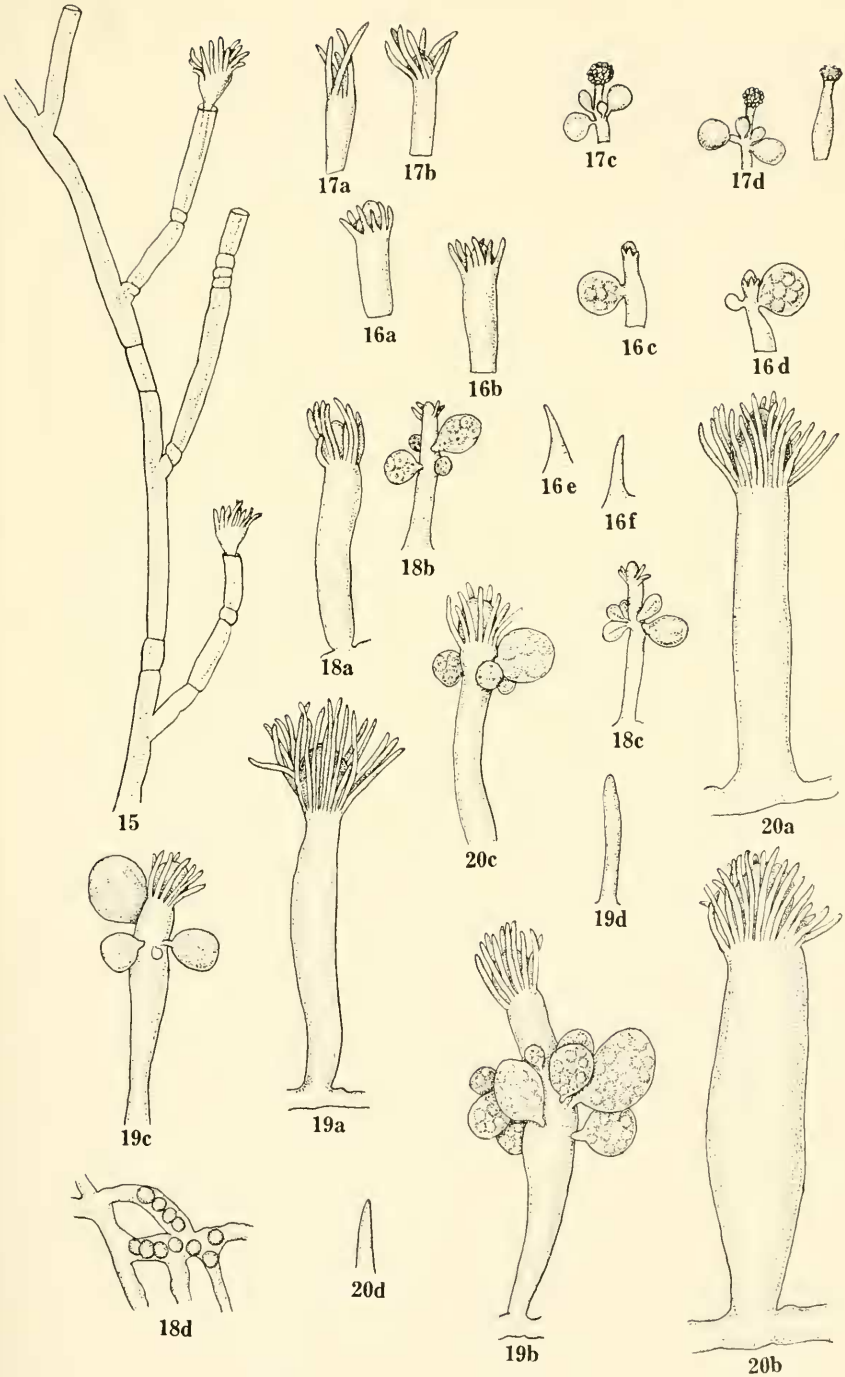
Fig. 16. *Hydractinia disjuncta*
a and b. Nutritive zooids.
c and d. Female generative zooids.
e and f. Spines.

Fig. 17. *Hydractinia epispongia*
a and b. Nutritive zooids.
c and d. Male generative zooids.
e. Dactylozooid.

Fig. 18. *Hydractinia hancocki*
a. Nutritive zooid.
b. Female generative zooid.
c. Male generative zooid.
d. Basal network with spheroidal bodies.

Fig. 19. *Hydractinia longispina*
a. Nutritive zooid.
b. Female generative zooid.
c. Male generative zooid.
d. Spine.

Fig. 20. *Hydractinia multispina*
a and b. Nutritive zooids.
c. Female generative zooid.
d. Spine.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20d
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20b

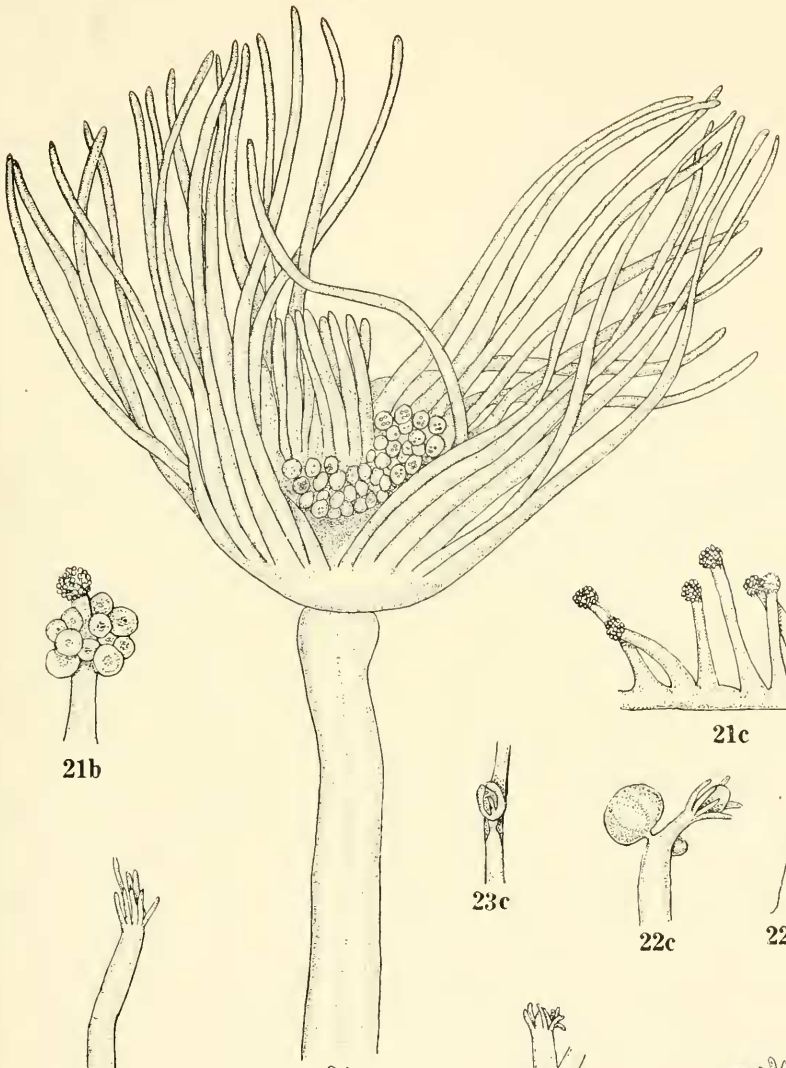
PLATE 5

Fig. 21. *Hydractinia polycarpa*
- a. Nutritive zooid.
- b. Female generative zooid.
- c. Dactylozooid.
- d. Spine.

Fig. 22. *Hydractinia quadrigemina*
- a. Nutritive zooid.
- b. Nutritive zooid, male generative zooid and spine.
- c. Male generative zooid.
- d. Spine.

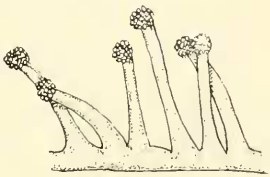
Fig. 23. *Podocoryne reticulata*
- a. Nutritive zooid.
- b and c. Generative zooids with medusa-buds.

Fig. 24. *Tubularia integra*
A zooid showing proximal and distal tentacles and gonophores.



24

21b



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23c

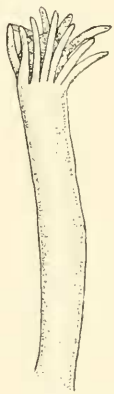
22c

22d

21a

23a

23b



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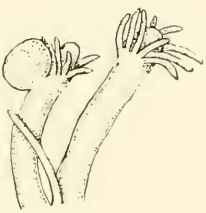
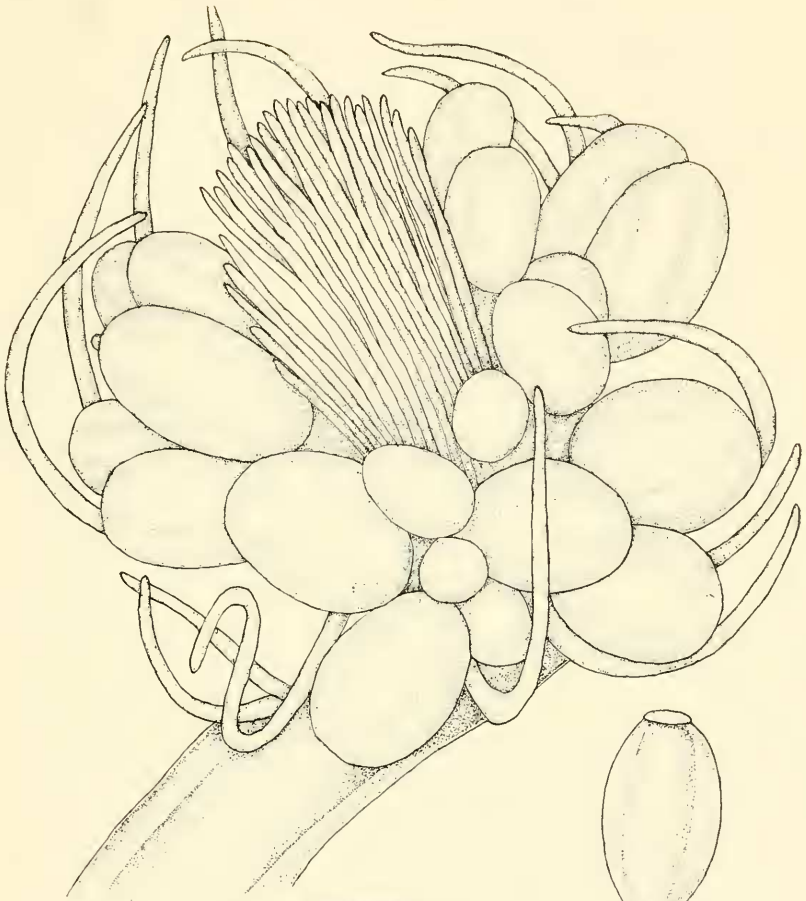


22b

21d

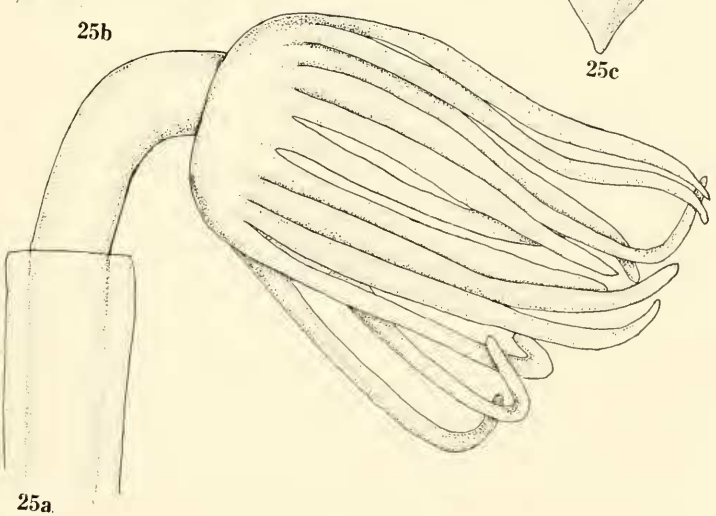
PLATE 6

Fig. 25. *Tubularia multidentata*
a. Immature zooid.
b. Zooid with tentacles and gonophores.
c. One gonophore.



25b

25c



25a

PLATE 7

Fig. 26. *Bonneviella minor*
Two zooids growing from a stolon.

Fig. 27. *Campanularia emarginata*
a, b, and c. Hydrothecae.

Fig. 28. *Campanularia gracilicaulis*
a and b. Hydrothecae.

Fig. 29. *Clytia acutidentata*
a. Colony with two hydrothecae.
b. Colony with hydrothecae and gonangia.

Fig. 30. *Clytia carinadentata*
Colony with hydrothecae.

Fig. 31. *Clytia fascicularis*
a. Fascicled stem with hydrothecae.
b. Single hydrotheca.
c. Gonangium.

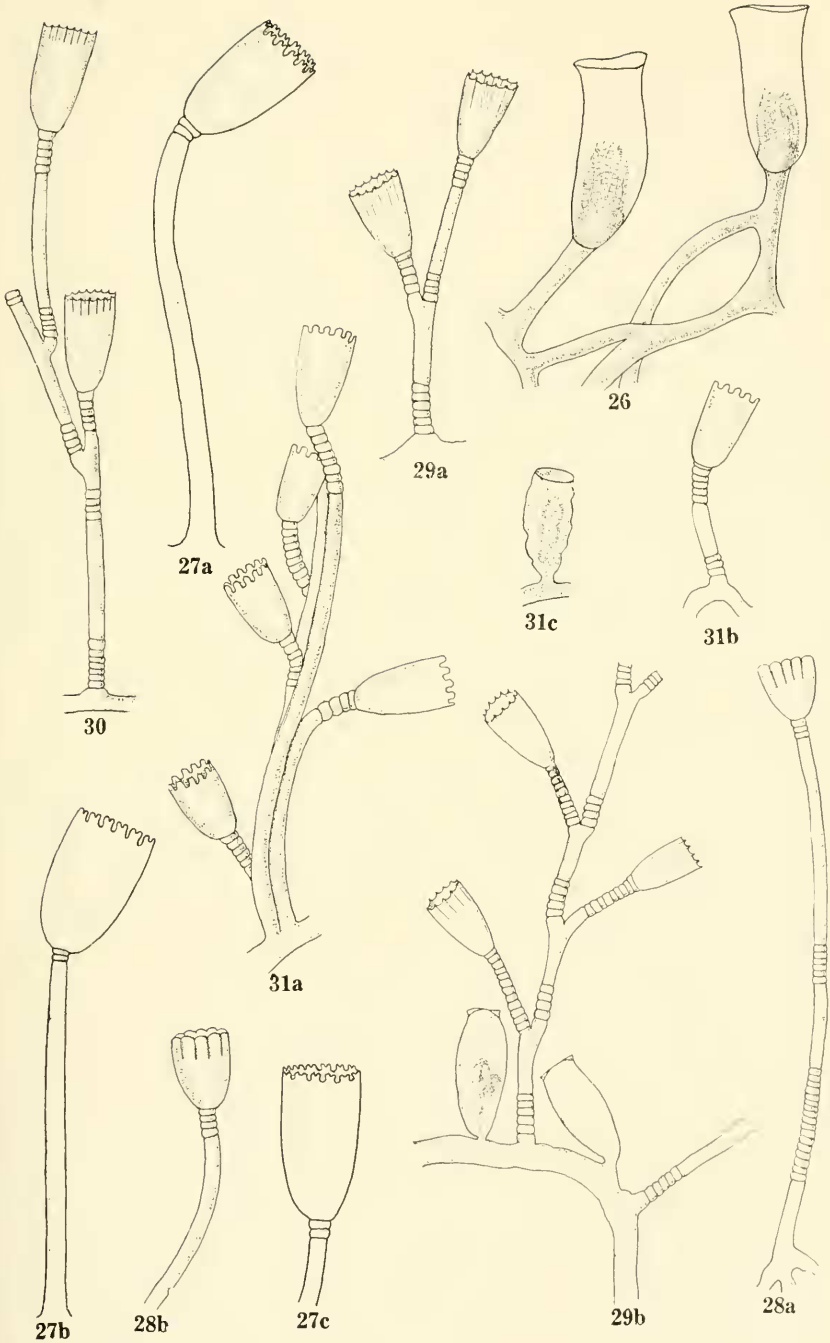

30
27a
29a
26
31c
31b
31a
27b
28b
27c
29b
28a

PLATE 8

Fig. 32. *Clytia irregularis*
Colony with hydrothecae and gonangia.

Fig. 33. *Clytia multidentata*
Hydrotheca.

Fig. 34. *Clytia raridentata*
Hydrotheca and gonangium.

Fig. 35. *Clytia seriata*
a. Portion of colony showing nature of series.
b. Portion of colony with hydrothecae and gonangium.

Fig. 36. *Eucopella minor*
a. Hydrotheca.
b. Gonangium.

Fig. 37. *Gonothyraea serialis*
a. Colony with hydrothecae.
b. Gonangium in axil.
c. Gonangium on stolon.

Fig. 38. *Obelia alternata*
a. Colony showing arrangement of hydrothecae.
b. Colony with hydrothecae and gonangium.

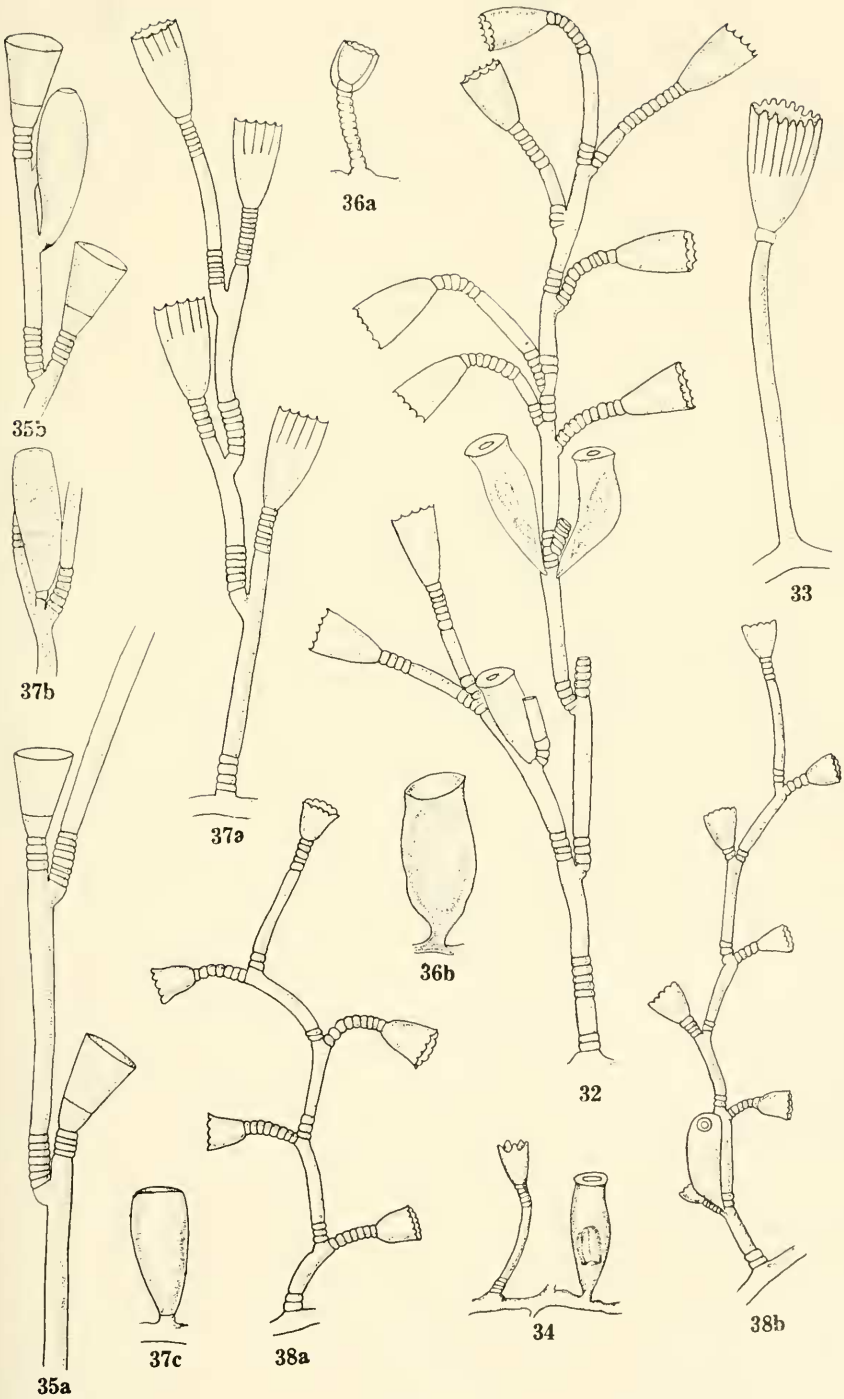

35b
37b
35a
37a
36a
36b
32
33
37c
38a
34
38b

PLATE 9

Fig. 39. *Obelia equilateralis*
a. Colony showing arrangement of hydrothecae.
b. Portion of colony with gonangium.

Fig. 40. *Obelia microtheca*
a and b. Colonies showing hydrothecae.
c and d. Gonangia.

Fig. 41. *Obelia obtusidens*
a. Colony with hydrothecae.
b. Gonangium.

Fig. 42. *Obelia tenuis*
a. Small colony.
b. Larger colony with hydrothecae and gonangia.

Fig. 43. *Campanulina ramosa*
A colony showing arrangement of hydrothecae.

Fig. 44. *Lovenella nodosa*
a. Portion of colony with hydrothecae and gonangium.
b. Hydrotheca with longer pedicel.

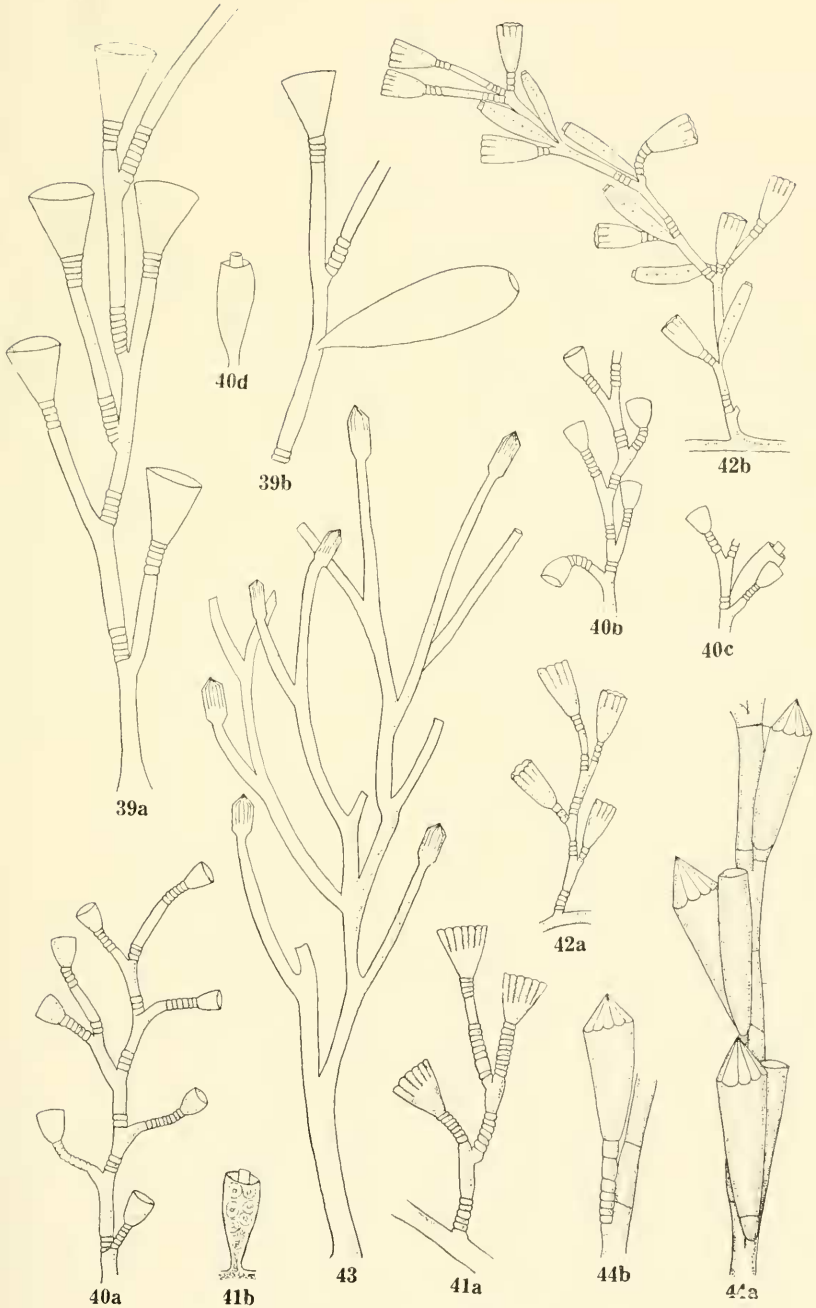

39a
40d
39b
42b
40b
40c
42a
40a
41b
43
41a
44b
44a

PLATE 10

Fig. 45. *Halecium fasciculatum*
a. Portion of colony showing fascicled stem.
b. Portion of branch, not fascicled.
c. Gonangium.

Fig. 46. *Halecium insolens*
a. Colonies showing arrangement of hydrothecae.
b. Gonangia.

Fig. 47. *Halecium regulare*
Colony showing arrangement of hydrothecae.

Fig. 48. *Halecium tortum*
a. Fascicled stem.
b. Portion of colony showing arrangement of hydrothecae.

Fig. 49. *Halecium vagans*
Colony showing branching.

Fig. 50. *Ophiodissa laxa*
Portion of colony showing arrangement of hydrothecae and tentacular organs.

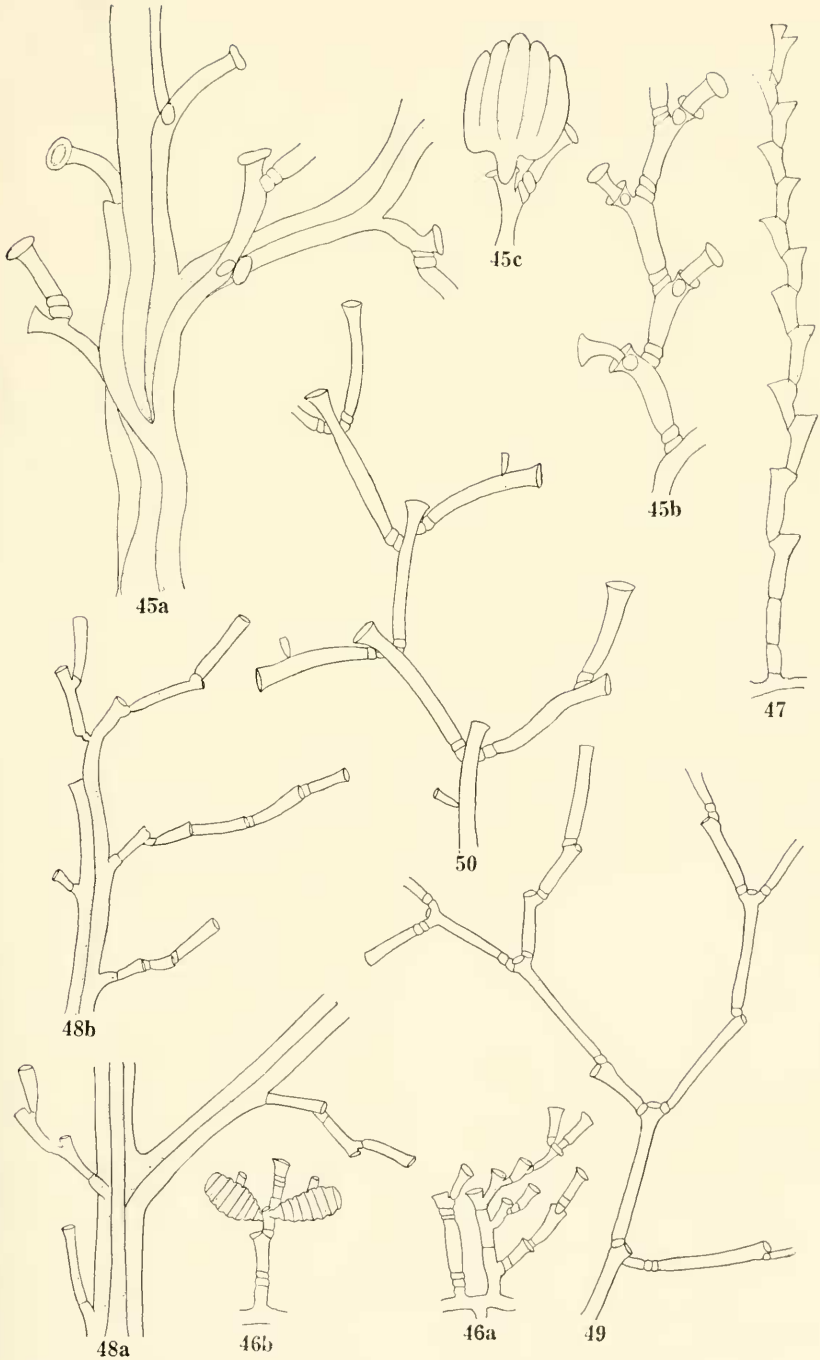

45a
45c
45b
47
50
48b
48a
46b
46a
49

PLATE 11

Fig. 51. *Ophiodissa negligens*
a and b. Colonies showing arrangement of hydrothecae and tentacular organs.

Fig. 52. *Scandia corrugata*
Colony showing hydrothecae and gonangia.

Fig. 53. *Lafoea intermedia*
a. Natural size showing coppinia.
b. Portion of fascicled stem.
c. Terminal portion of branch.
d. Coppinia.

Fig. 54. *Lictorella adhaerens*
a. Portion of fascicled stem.
b. Portion of branch.

Fig. 55. *Synthecium projectum*
Portion of colony arrangement of hydrothecae.

Fig. 56. *Synthecium rigidum*
Portion of colony showing arrangement of hydrothecae.

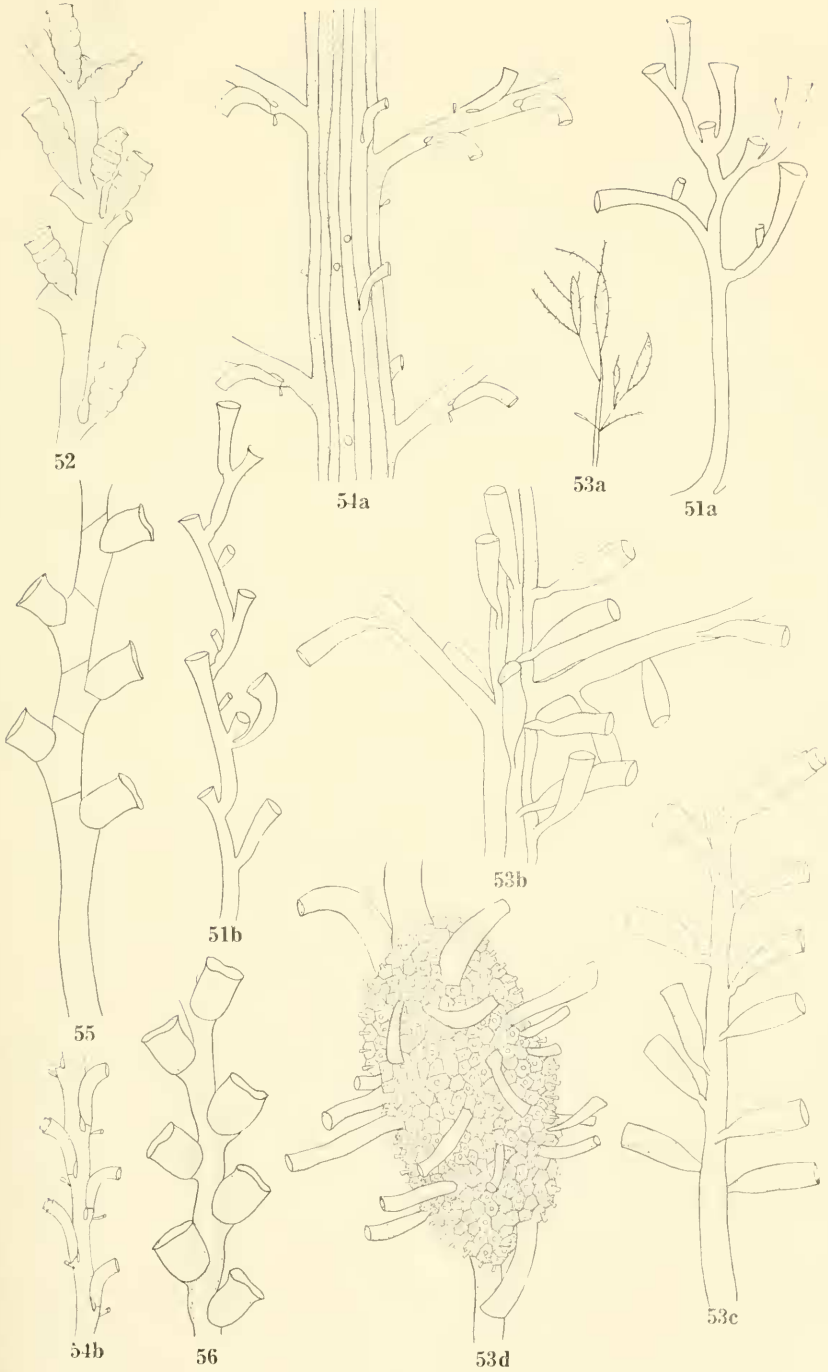

52
54a
53a
51a
55
51b
53b
54b
56
53d
53c

PLATE 12

Fig. 57. *Synthecium symmetricum*
a. Portion of branch showing arrangement of hydrothecae.
b. Portion of stem showing origin of branches.
c. Gonangia.

Fig. 58. *Sertularella ampullacea*
Portion of colony showing branching and hydrothecae.

Fig. 59. *Sertularella exilis*
a and b. Portions of colony showing arrangement of hydrothecae.

Fig. 60. *Sertularella incisa*
a. Portion of stem showing branching.
b. Portion of branch.

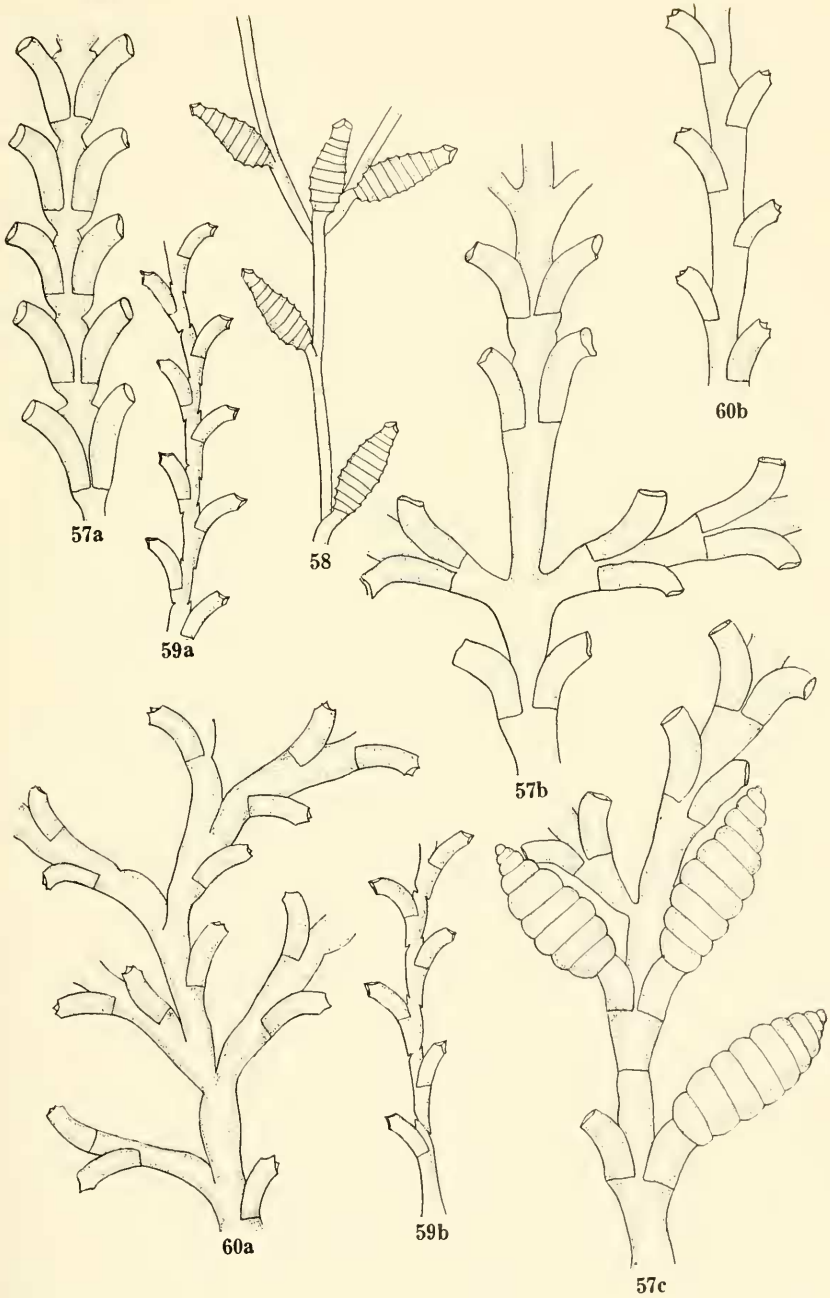

57a
59a
58
60b
57b
60a
59b
57c

PLATE 13

Fig. 61. *Sertularia anceps*
Colony showing branching.

Fig. 62. *Sertularia dispar*
a. Portion of stem, face view.
b. Portion of stem, back view.
c. Gonangium.

Fig. 63. *Thuiaria simplex*
Portion of colony showing arrangement of hydrothecae.

Fig. 64. *Aglaophenia praecisa*
a. Two hydrothecae on a hydrocladium.
b. The same further enlarged.

Fig. 65. *Antennella compacta*
a. Portion of colony showing hydrothecae.
b. Gonangium.

Fig. 66. *Antennularia alternata*
Portion of colony showing branching, hydrothecae and gonangia.

Fig. 67. *Antennularia irregularis*
Portion of colony showing branching and hydrothecae.

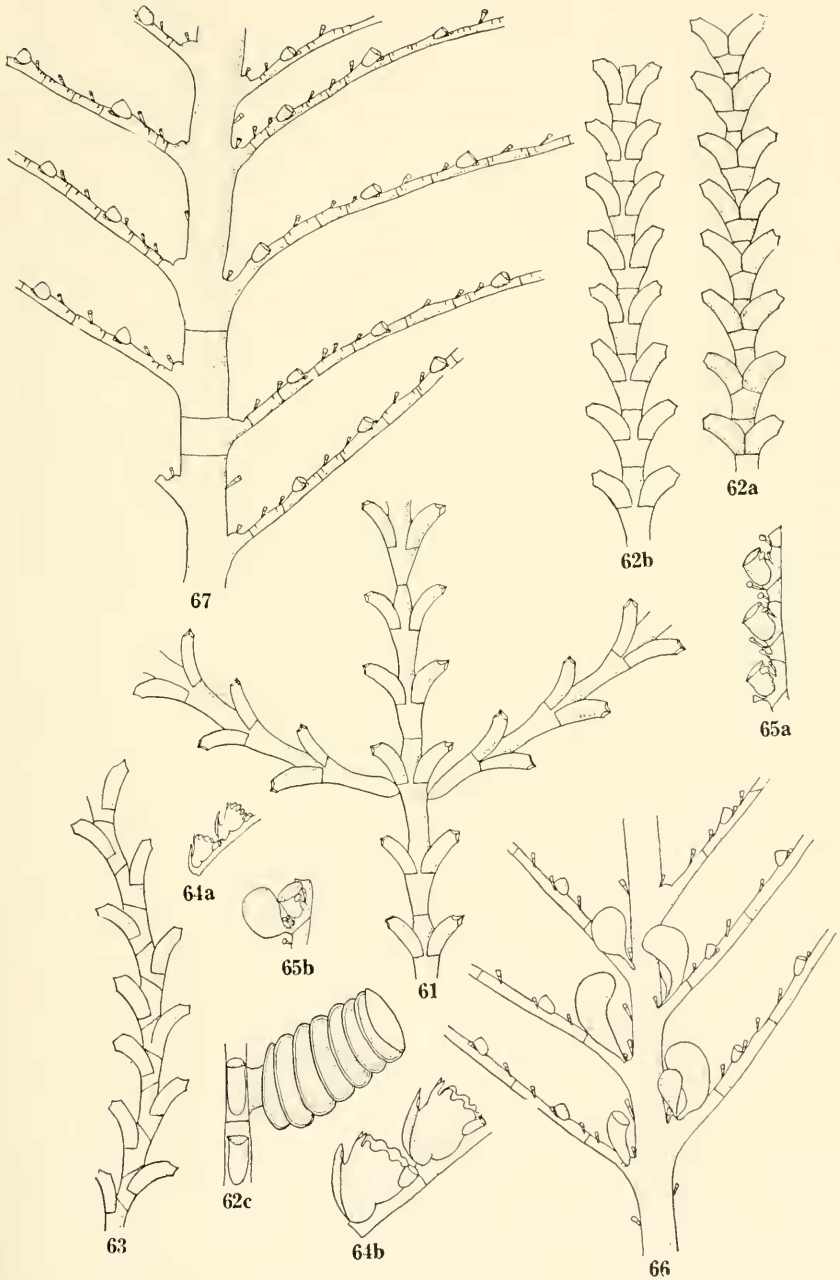

67
62b
62a
65a
61
64a
65b
63
62c
64b
66

PLATE 14

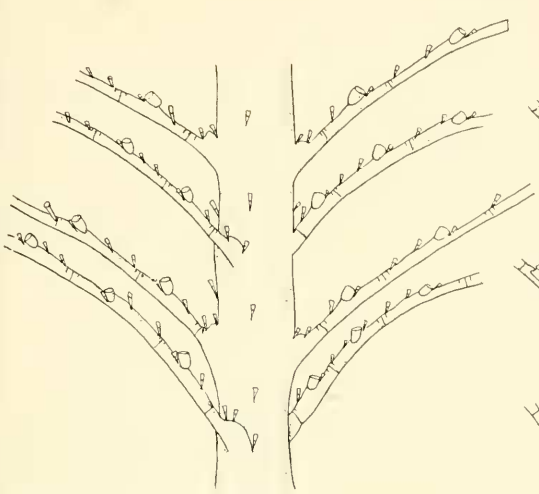
Fig. 68. *Antennularia tetraseriata*
Portion of colony showing hydrocladia arrangement.

Fig. 69. *Cladocarpus tortus*
a. Basal portion of stem.
b. Portion of stem and proximal hydrothecae on the hydrocladia.
c. Lateral view of hydrocladium.

Fig. 70. *Plumularia acutifrons*
Portion of colony showing hydrocladia.

Fig. 71. *Plumularia alternata*
a. Portion of colony showing hydrocladia.
b. Gonangia.

Fig. 72. *Plumularia biarmata*
Portion of colony showing hydrocladia.



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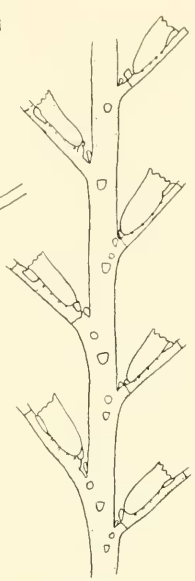
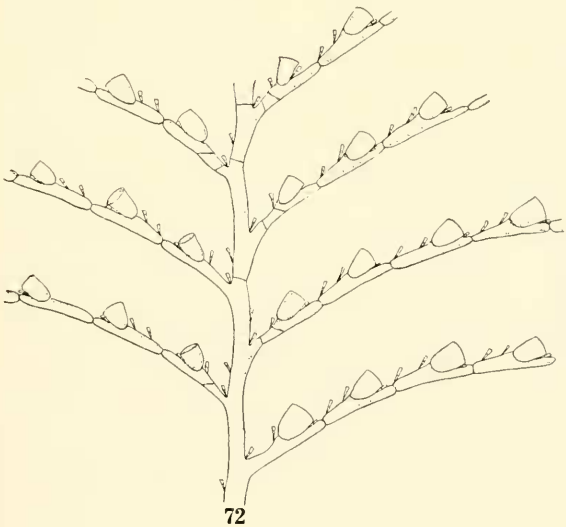


69b

69a



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71b

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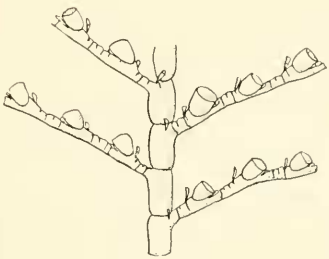

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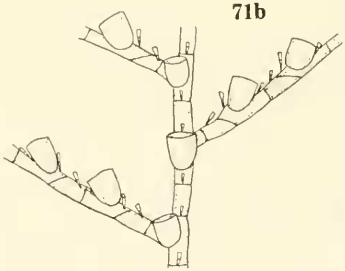


71a

PLATE 15

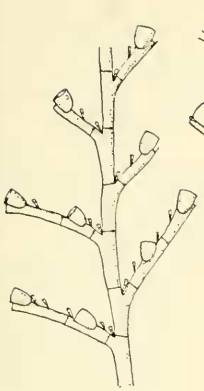
Fig. 73. *Plumularia defecta*
Portion of colony showing hydrocladia.

Fig. 74. *Plumularia inermis*
a. Portion of colony showing hydrocladia.
b. Gonangia.

Fig. 75. *Plumularia magellanica*
a. Colony showing hydrocladia.
b. Gonangia.

Fig. 76. *Plumularia propinqua*
a. Colony showing hydrocladia.
b. Gonangia.

Fig. 77. *Plumularia sinuosa*
Portion of colony showing hydrocladia.



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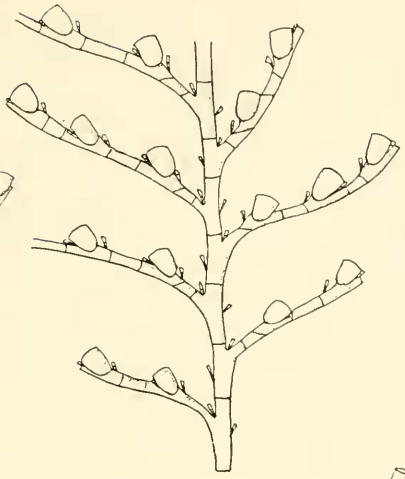

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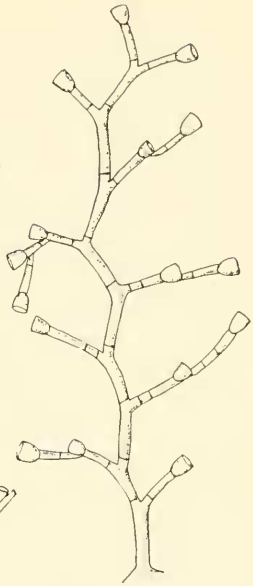

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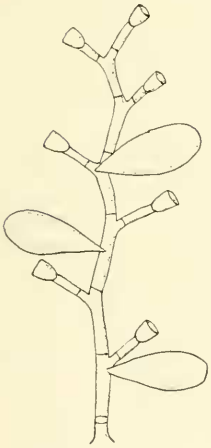

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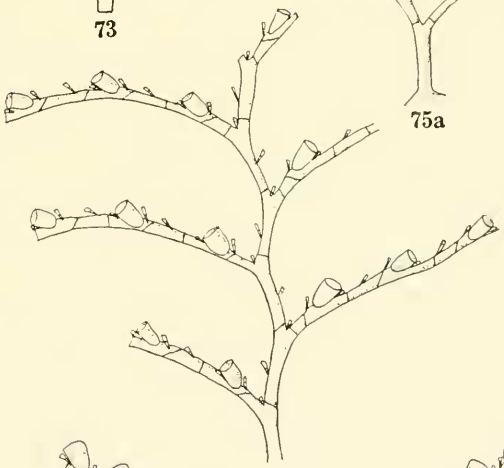

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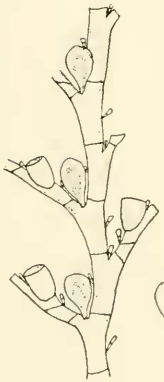

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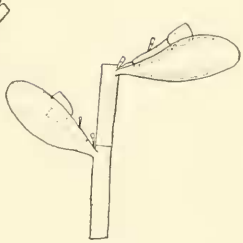

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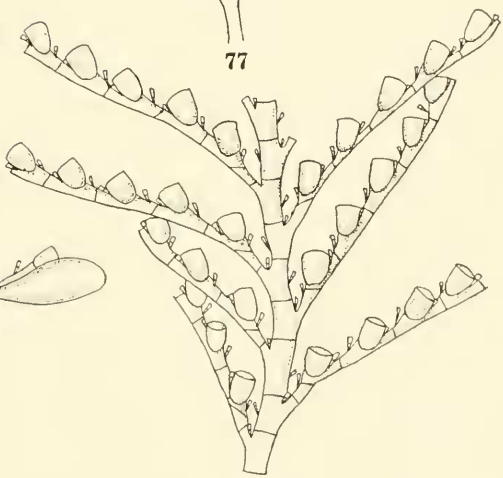

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